

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

62.61

Fred C.

U. S. Department of Agriculture
★ JAN 31 1950

Gloeckner
New York, N.Y.
Chrysanthemum
Manual



1950



Continuous Flowering of Chrysanthemums

Since the advent of day-length and temperature control we have seen chrysanthemum cut flowers on the markets every month since 1946. We have observed this history in the making and have the opinions of all branches of the trade and are happy to report that the majority are finding no serious objection to having a steady diet of chrysanthemums. Retailers are very optimistic in having such a long-lasting flower as the chrysanthemum the year around.

To have a continuous bloom requires precision growing and the regulation of all factors affecting plant growth. This program will only fit the specialist who is equipped to give proper temperature and length of day.

Varieties play an important part in continuous flowering. The present list of varieties have all been tried and those recommended for continuous bloom will be found in another part of this manual. Plant breeders are busy producing new varieties with this result in mind.

Continuous flowering will very likely elevate the already high position of the chrysanthemum as a florist cut flower. Some specialists predict that chrysanthemums will be the most important of the commercial florist crops.

Likewise, the selling of chrysanthemum cuttings has reached the precision phase. You want to purchase your cuttings from the person who is posted on the latest information and can help you plan your crop successfully.

Our representatives are all well versed in the culture of chrysanthemums. They know the peculiarities of the various varieties and are capable and skilled in planning your requirements for the coming season.

It is a *Gloeckner* service to make available the latest cultural information on this crop.



15 EAST 26th ST., NEW YORK 10, N. Y.

LExington 2-4197

At Madison Avenue

MUM MANUAL CONTENTS

Anemone Varieties	38	Pompon Varieties	36-37
Continuous Flowering	11-21	Pot Plant Culture	22-23
Cultural Pointers	1-10	Pot Plant Varieties	39
Garden Varieties	39	Shading Information	11-21
Insects and Their Control	24-27	Single Varieties	38
Large Flowering Varieties	34-35	Spider Varieties	35
Newer Insecticides	31	Stunt	30
Novelty Varieties	32-33	Viruses	30
Pests and Their Control	28-30		


TERMS OF SALE

Fifty rooted cuttings of each variety is the minimum that can be supplied.

More than 50 of a variety must be in multiples of 50.

Any changes or cancellations of chrysanthemum orders must be received at least 30 days before shipping date.

Every effort is being made to deliver stock which is free from stunt, but purchases must be made with the understanding that we assume no responsibility for losses which may result from stunt.



Better Chrysanthemums

CUTTINGS

To grow good chrysanthemums the first requisite is starting with Verticillium Wilt and Stunt free cuttings. Wilt free cuttings are easily secured. Now with the extreme care in selecting stunt free stock and the careful handling we are very optimistic in stating that stunt should be practically nil in the stock for the coming season.

Handling Cuttings

The cuttings you purchase are ready for potting or flatting. Many growers plant these rooted cuttings directly into the final location. Ordinarily they will not require shading, but if they have been several days in transit and have softened up some, or if they are planted during warm, bright weather shading with aster cloth or paper is advisable. Under no circumstances leave the covering on the plants during dull weather or at night. It is well to syringe the plants frequently until they stand up and are showing signs of growth.

Deliveries

With the advent of the time pinch and the precision method of culture it is necessary to have your cuttings arrive at a definite date. To insure proper delivery you must plan your cutting requirements months in advance of the date wanted. We would appreciate it if you could let us know your requirements so that our propagator could plan his growing of stock plants and cuttings more systematically.

Delays

With the reduced delivery schedule of the Railway Express Agency there may be delays in delivering your shipments. Chrysanthemum cuttings will be injured from cold as well as being too long in transit. If the cuttings are slightly wilted, they can be immersed in water for a short period and then planted. They will react perfectly to such treatment. If the cuttings have been slightly frozen, placing them in a cool room and thawing them out gradually, or placing them in a pail of cool water to take the frost out will bring them through so that they will do just as well as cuttings that have had nothing happen to them. Of course, if stock is badly frozen, or if long delays have occurred so that the cuttings are heated, yellow or rotted, a claim should be filed at once with the express company.

Air Freight

We have been very well satisfied with the use of Air Freight to deliver rooted cuttings this past season. Customers who are close to an airport are naturally served better than those who have to have their shipments reconsigned via Railway Express. If you are planning on using air freight it is well to have your telephone number appear on all shipping labels.

Premature Budding

Have you experienced premature budding of chrysanthemums in previous years? If you did your temperatures were above 60 degrees and the length of day was short enough to cause budding. We suggest that if you get your cuttings before May 1 you should place them under additional light for at least two hours each night, either from sundown or at midnight. Use 60-watt bulbs, spaced 4 feet apart, 30 inches above plants. Discontinue lighting May 1.



General View of Propagating House



Healthy Well-Rooted Cuttings

Cultural Pointers

SOILS

Chrysanthemums will grow well in a wide range of soil types but a fibrous silt loam is preferred. Blue grass sod to which rotted manure has been added plus an application of super phosphate will give excellent results. Porosity to permit rapid penetration of water and a uniform supply of fertilizer are the reasons for the great care in soil preparation.

Acidity

Evidence shows that the soil reaction should be slightly acid pH 6.5, although in many instances a neutral medium does very well. If your soil tests slightly alkaline apply $\frac{1}{2}$ to one pound of agricultural sulfur per 100 square feet of area. However, if your soil is acid apply 3 to 5 pounds of agricultural ground limestone per 100 square feet of area.

Steam Sterilization

Steam sterilization is the only practical means known to destroy the verticillium wilt organisms present in many soils. The cuttings you purchase are free from wilt but if planted in soil that is not steam sterilized many will contract the trouble.

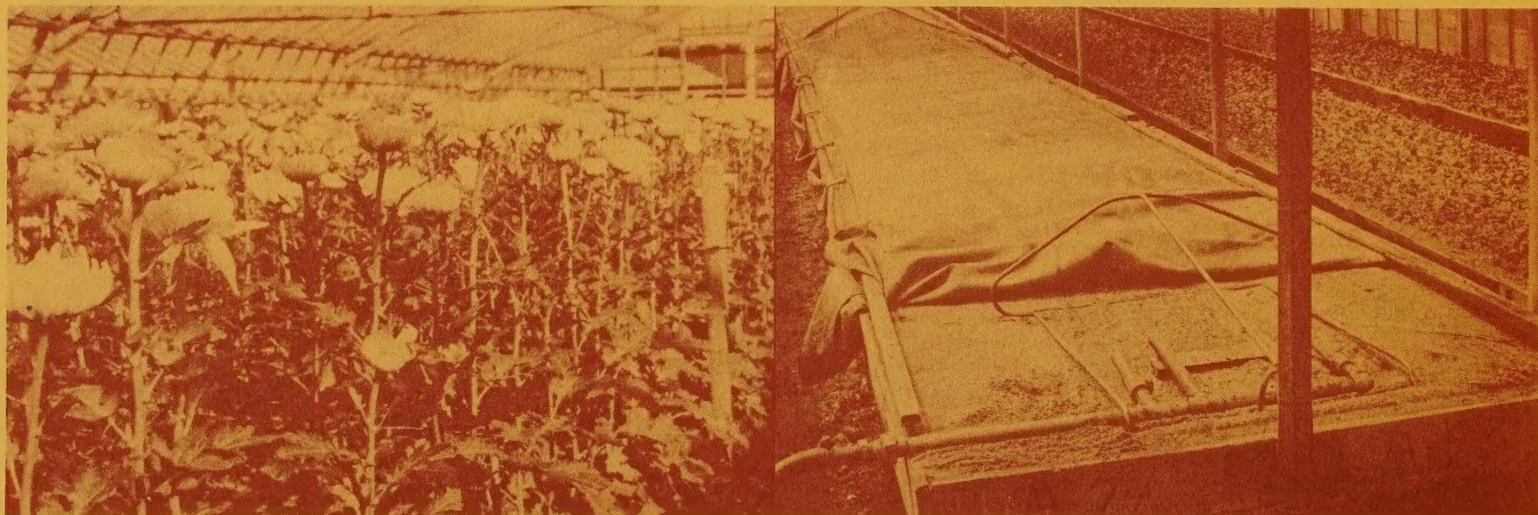
Old soil when properly managed will give comparable results with fresh soil. Add a quarter of the volume of humus in the form of manure or chopped alfalfa or red clover hay. Steam sterilize to destroy the verticillium wilt fungus as well as improve the structure of the soil. Steam sterilization may be done with the use of three inch tile or down spouting with $\frac{1}{8}$ holes drilled every six inches on each side of the pipe. Use two lines in a three and one-half foot bench. Ridge the soil to the center of the bench directly over the lines, covering with tarpaulin, canvas or sisalkraft. The Thomas method is very similar with the exception that the pipe is laid on top of the soil and then covered so as to make it airtight. The Thomas method is not recommended where purlin posts are in the bench.

By introducing the steam in the center of a 100 foot bench and sending the steam both directions a more thorough sterilization is accomplished than if the steam were to be forced in at the end of the 100 foot bench. Cover the sides of the benches so that the entire bench and contents are heated to 180°F. Remove the covering one hour after the steam has been cut. This allows the excess moisture to pass from the soil as vapor. Leach heavily immediately after sterilizing to reduce excess fertility.

Chemical Sterilization


A chemical which has proven its worth is Larvacide. This material must be used when the greenhouses are empty to avoid injury to adjoining crops. This gas is applied in liquid form with a special applicator so that 2 or 3 c. c. are applied at 10 inch centers. The soil should be moist before applying. A good suitable covering should be placed over the treated soil to keep the gas in the soil for at least 48 hours although a water seal applied 2 to 3 times every 24 hours will suffice. The soil temperature should be at least 60 degrees or higher. When used properly you can expect favorable control of insects, diseases and weed seeds.

Dowfume MC 2 has been tried and found to control nematodes, weed seeds, and some damping off organisms. Best results are obtained when the soil temperature is above 60°F. About the same procedure should be followed in its application as that described for Larvacide.



Box Stringing Tying Method Used on Standards

Thomas Method of Steam Sterilization



Cultural Pointers

SOILS

Aeration

Proper drainage and proper aeration of the soil are very vital to good growth. Many times improper drainage of the bench or bed is the reason for a poor crop. No wet spots should ever be present. Soil drainage may be improved by the addition of various materials. Any coarse organic material such as manure, alfalfa hay or clover hay applied at the rate of not to exceed one-fourth the volume will separate the soil particles sufficiently to increase pore space. Heavy applications of sand to a soil have not always proven of value to a chrysanthemum crop. Aeration may also be increased by proper cultivation of the soil. Frequent scratchings are recommended during the early growth of the crop.

Soil Management

Soils vary a great deal over the country and yet many good crops of chrysanthemums are grown on all types of soil. Soil itself is not the most important but soil management is of extreme importance. In considering the management of soil the following pointers are suggested:

1. Apply a quarter of the volume of manure or other organic substitute once a year, usually just before steam sterilization.
2. Steam sterilize the soil to a temperature of 180°F. once a year.
3. After sterilization leach with 7 gallons of water per square foot. The amount will vary with the type of soil.
4. Apply 5 pounds of gypsum (Calcium sulfate) per 100 square feet. Apply gypsum just before planting.
5. Test soil for acidity and make correction before planting.
6. Apply 5 pounds of super phosphate per 100 square feet of area once a year. Better to have an excess of phosphorus than a lack.
7. Wait seven days from time of sterilization to planting.
8. Maintain the following nutrient levels:

Nitrate Nitrogen	5 — 10	p.p.m.
Phosphorus	5 — 10	p.p.m.
Potassium	20 — 40	p.p.m.
Calcium	200 — 250	p.p.m.
Solubridge reading	low	

9. Water thoroughly at every watering.
10. Apply a complete fertilizer at time of bud initiation. Heavy watering and light on the fertilizer will make chrysanthemums grow.



Terminal Spray Formation Resulting From Time Pinching



Cultural Pointers FERTILIZERS

Soil structure is the key to soil fertility. The response of chrysanthemums to fertilization depends upon a favorable soil structure. It is known that plants require nutrients, water and air for growth. Good soil structure will provide proper air and water relationships. Therefore, it behooves us to give proper attention to the soil before starting the crop.

Feeding

Chrysanthemums do much better right from the start if the soil is not too rich. Very often this crop will start off faster in new soil as compared with old soil that has been sterilized just because of the lower nutrient level in the new soil. When using new soil, apply 5 lbs. of super phosphate per 100 sq. ft. of area, plus a liberal application of manure before planting. Phosphorus moves slowly within the soil mixture. It should always be added before the crop is benched so that it may be mixed thoroughly into the soil. One to two applications of a complete fertilizer, such as Electra, made after the plants become established and until color shows will be adequate. Electra applied at the rate of 2 pounds per 100 sq. ft. of bed is sufficient. Never apply fertilizers to a dry soil. Water lightly first, then apply the proper quantity of fertilizer, then water heavily. Liquid feeding with water soluble fertilizers is fast becoming the latest method of applying fertilizer. **Remember that the plant is the best guide as to fertilizer requirements and that more mums are ruined by overfeeding than by nutrient deficiencies.**

When using sterilized soil the best recommendations to follow would be to analyze your soil from time to time. We have found that when the following nutrient levels are kept, good crops are the result. **Nitrate nitrogen should be 5 - 10 parts per million; phosphorus 5 - 10 parts per million; potassium 20 - 40 p.p.m. and calcium near 200 p.p.m.** To increase the nitrate level feed one pound of ammonium sulfate per 100 sq. ft. of area, and to bring up the potassium apply muriate of potash not to exceed 1 lb. per 100 sq. ft.

Liberal application of calcium sulfate (gypsum) 5 pounds per 100 square feet after steam sterilization will prevent injury to young roots. High phosphorus also reduces toxicity after sterilization.

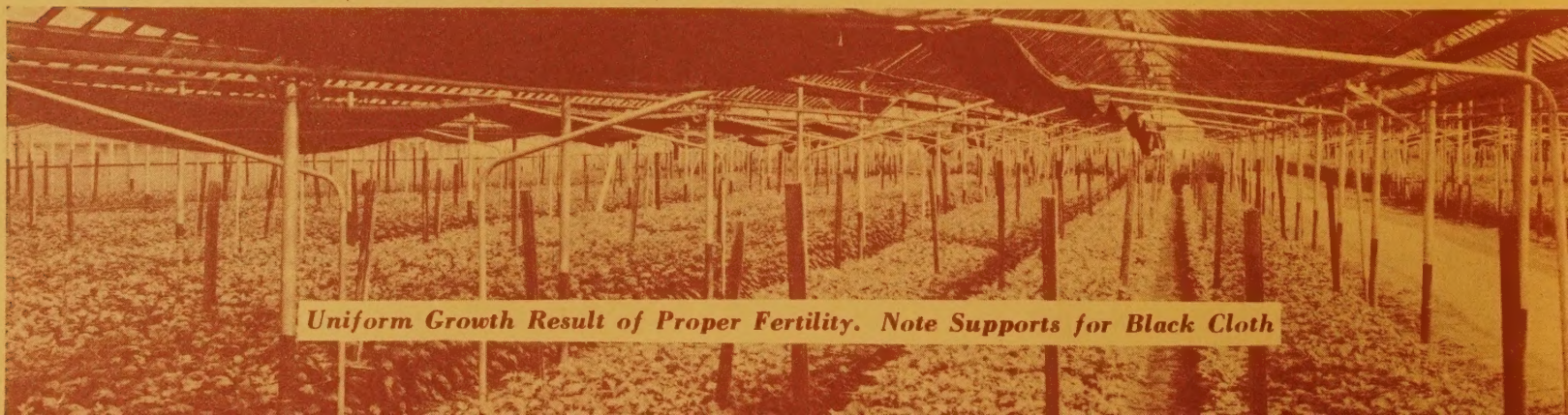
In the cooler weather and shorter days of September omit the nitrogen if the plants are growing freely. The mum assimilates more phosphorus and potassium during the time of bud initiation. Therefore, it is desirable to apply a complete fertilizer shortly after the buds are visible.

Excess of Soluble Salts

The foregoing pertains to plants that appear and behave normally. If plants are stunted, look yellow and sick, they are probably suffering from an extremely rich soil. Many greenhouse soils are excessively rich and chrysanthemums will not thrive in such a medium. If this is the case, the remedy is leaching with water. Lots and lots of it. Use more water than you ever applied to a bench before, two or three gallons per square foot. The water that runs through the soil carries with it the excessive plant food and allows your plants to recover from their indigestion. Did you ever notice fine healthy growth on a small part of a sick-looking bed of mums, and observe that it was under a broken pane of glass that allowed the rain water to come through and leach the soil below? Such a sight is a sure indication that the soil needed leaching. In most cases this condition is the result of the foolish and indiscriminate use of fertilizers. Use them when needed, but use them judiciously. Remember fertilizers are plant food in an extremely concentrated form.

Mulches

A mulch of peat, rotted manure, ground corn cobs, alfalfa or red clover hay applied two to three weeks after planting will help maintain a uniform moisture in the soil and increase the growth. The strawy mulches should only be used when the nutrient level is high as the bacteria remove the nutrients from the soil to decompose the strawy mulch.



Uniform Growth Result of Proper Fertility. Note Supports for Black Cloth

Cultural Pointers

PLANTING

Chrysanthemums grow equally as well on a raised bench or on a ground bed. The care is slightly different in that raised benches dry out more frequently during the summer and early fall months. It must be remembered that a good circulation of air is desirable, yet a direct draft is not advisable.

Planting Date

The plants to be shaded should be planted seven weeks before the shading date in order that sufficient growth is made to give necessary height before black cloth is applied. For normal flowering all planting should be done in the month of June. The plants should be established in the soil three to four weeks before pinching.

Planting Rooted Cuttings

Many florists are planting rooted cuttings directly into permanent locations. This not only reduces several handlings and production costs, but also produces a better quality bloom. We fully realize that it is often an impossibility for all to treat their chrysanthemums this way. However, we have found that young, soft plants are superior to hard woody plants.

When planting rooted cuttings either into 2 1/4" pots or directly into the bench, dip the tops of the cuttings, into a solution of **Fermate** 1 ounce to 4 gallons of water. This will establish the plants faster as well as protect the young plant from septoria leaf spot. If you plant in a cloth house or directly in the open be sure to add this to your must list.

Shading the Glass

When planting rooted cuttings into their permanent position it is necessary to shade the glass or to put aster cloth directly over the young plants until they are established. When shading the glass be sure that the material is applied lightly.

It is definitely advantageous to have some shade on the glass during the months of June and July when the light intensity is the highest. Cloth houses eliminate approximately one-third of the light and we all know what excellent results are obtained under this enclosure. Therefore, shading the glass lightly should likewise be beneficial. Remember not to allow the shade to remain on the glass too late in the season.

Distance of Planting

For good quality pompons we prefer to plant 7x8 inches or 8x8 inches pinched once, and thin the shoots to three per plant. The outside rows will support one more stem than the center rows in the bed. Nothing is gained by planting at a closer distance. Light intensity should be high at the base of the plant for quality blooms and if planted too close we have lost the factor which promotes quality. Large flowered varieties are generally planted 8x8 inches or 8x9 inches, this also applies to disbud anemone and single varieties. When following the no-pinch method plant 6x6 inches.

Several growers have had success by planting two plants to a hill, spacing the hills 10x10 inches, pinching once and allowing six sprays per hill. This will require a few more plants but it is claimed that when planted further apart it is easier to spray and string. A higher production per square foot is obtained.

Knowledge of the varieties, date of benching as well as your method of growing will largely govern the distance of planting.



String Method of Supporting Standard Mums

Cultural Pointers



Well Established Young Plant



Top Several Inches Removed



*Strong Breaks Resulting
from Single Pinch*

PINCHING

For a good number of years the reason for pinching was to regulate the number of stems on the plant. In recent years we have learned that in case of pompons or singles the pinching determines the type of spray formation. With standards, pinching will determine the type of bud formation, whether it be a crown or terminal bud.

Time Pinching

The precision culture of chrysanthemums is all set up around the "Last Pinch." To grow a quality pompon you should receive the rooted cuttings sometime in June and then plant into the permanent location approximately three to four weeks before the date listed in our list of varieties under "Last Pinch." When growing shaded pompons the "Last Pinch" should be 21 to 35 days before the shading date. When shading the 60- to 66-day varieties the last pinch should be 30 to 35 days from pinch to shade while the 76-day varieties require only 21 to 28 days from date of pinch to date of shade. Time pinching standards will eliminate the formation of the crown bud and produce terminal buds which will in turn produce a much straighter flowering stem.

Pruning

Another important factor is to remove all shoots but 3 or 4 per plant, in a few instances only 2 shoots are allowed to mature. Allow more shoots to develop on the outside rows than on the center rows of a bed. When fewer breaks are selected the planting distance should be closer. If you prefer to have a number of smaller sprays, with fewer blooms open at one time, follow the double pinching procedure.

Standards are usually pinched once to induce breaks so that they may be grown two per plant. The strongest breaks are selected and all others removed. It is well to pinch on the date suggested in the general list. Careful observation has shown us that neckiness with some varieties is eliminated by pinching on the respective dates. Singles and anemones are usually grown 3 to 4 stems per plant.

Condition of Plant

When pinching, remove only the soft growth, never cut into the woody stems as this will not produce the type of breaks you desire. It is our experience that it is best not to pinch until the plant has become well established in its permanent location. In all cases it is better to have at least eight to ten inches of growth on the plants before pinching. (Photos above.)

When double pinching, pinch the first time 30 days before the "Last Pinch". This allows enough time to produce a growth long enough to pinch at the proper time.

If by chance you are delayed in planting and your plants will be too tall, it is advisable to pinch early enough before benching so that the breaks will be several inches long at time of planting. Never pinch hard plants at the same time they are planted into the bench, a heavy loss may result. Better wait until plants are established, then pinch.

The last pinching dates given after each variety will help you grow that variety to excellency. Remember that pinching is just one cultural factor and will only function when all other cultural points are carried out properly.



Cultural Pointers

DISBUDDING

Large flowered varieties produce side shoots in the axils of the leaves which should be removed very close to the base at regular weekly intervals. Disbuds are handled the same as standards.

Taking Bud

Taking bud means allowing the flowering bud to remain and removing all others, applies to standards and disbuds. The chrysanthemum usually produces two distinct types of flowering buds—Crown and Terminal. The first bud produced is called the crown bud and is distinguished by being surrounded by other lateral leaf buds. The second is the terminal bud and is surrounded by several flower buds. If the plant is planted especially early, a second crown bud might appear. In appearance this second crown bud is exactly the same as the first.

The procedure of "Taking Bud" depends very largely on the variety. Usually the safest rule to follow is not to select a bud on early or midseason varieties before August 25. In our list of large flowered varieties under "Select Bud" you will find the date on which to select the proper bud. If bud is selected too early a large percentage of the flowers will be crippled. Good common sense must be used to determine the proper selection of bud.

The formation of the crown bud usually does not take place when growing according to the "Time Pinch Plan". When following "Time Pinch" select the first bud that appears. This will result in straight stems without the dogleg growth that appears when second bud is taken.

The final selection of bud should not be made when the cluster buds are too small as this will very likely cause injury to the stem near the bloom. Likewise it is not advisable to delay selecting the bud too long. Some growers like to leave an alternate bud until they are certain that nothing will happen to the one finally selected.

DISBUDDED SPRAYS

The procedure in growing disbudded sprays, is to wait until the crown bud forms, then remove all vegetative shoots but three. Later when terminal buds appear disbud each shoot similar to the normal disbudding of standards. When the blooms mature there are three flowers on each spray. In singles and anemones, the size of the blooms will be a trifle smaller than when they are grown as one flower per stem. Raise three stems per plant similar to straight disbud. Varieties such as Goldsmith, Valencia, etc., can be grown as disbudded sprays.

Good Chrysanthemums result from the careful and thorough practice of the basic principles of plant growth, plus the acknowledgment of certain differences in the nature of various varieties. Growing disbudded sprays is a modification in culture which is very much worthwhile.



Early or Crown bud surrounded by lateral buds



Late or Terminal bud surrounded by flower buds



Late or Terminal bud selected



Cultural Pointers

WATERING

The knowledge of proper watering is essential to success. Chrysanthemums produce extremely heavy foliage and a great deal of water is required at the roots, and under ordinary conditions of bench culture overwatering would be difficult. When grown in beds more care should be exercised in watering. After benching young plants grown in 2¼" pots, spot watering around the plants is more desirable than watering the entire area. When the plants become established the entire area should be given a thorough watering. A trowel should be used to examine the soil to determine the necessity of watering. Some soils look wet on the surface but are very dry several inches below.

Steam sterilization causes the soil to become more granular and capillary movement of water in it is much slower than in soils not steamed. Cuttings planted in it cannot obtain water readily, and for this reason should be kept more moist than in not sterilized soils.

When planting rooted cuttings directly into their permanent locations it is essential to water thoroughly to set the soil around the plant roots. We suggest double watering again when the soil gets on the dry side. By this time the plants are established and regular watering should be followed. Keep humidity in the house by wetting down bench and walks.

Surface Watering

During the past several years many labor saving devices have been developed. Surface watering is one that will save many hours of hand watering your chrysanthemum crop.

The Skinner Superior nozzle is the final answer to the exacting requirements of surface watering. An absolutely flat uniform spray is obtained over a full circle with a constant pattern under any pressure. This nozzle throws a fine spray 5 feet in diameter at 5 pounds pressure at the nozzle, and uses 0.9 gallons per minute.

When installing surface watering, check your water supply and the capacity needed to irrigate your area. It is advisable to have an engineer figure out your requirements.

Leaching

Many greenhouse soils are excessively rich and chrysanthemums will not thrive in such a medium. If this is the case, the remedy is leaching with water. After the soil is sterilized it should be leached. Use a skinner line and allow it to run for hours if necessary. Raised benches do not require as much water to leach.

Syringing

During the heat of the summer it is beneficial to syringe or spray the foliage of chrysanthemums. When syringing is started around 8:00 A.M. and continued at regular intervals, with the help of a light shade on the glass, the house temperature can be kept down and the humidity raised within the house. When the growth becomes thick or when the nights get chilly discontinue all syringing. Some growers who grow quality mums tell us that they do not syringe their crop during the entire season.



Superior Nozzle Showing Uniformity of Pattern

Cultural Pointers

TEMPERATURE AND LIGHT

Chrysanthemums grow most rapidly under conditions of high light intensity and with a temperature above 60°F. In the midwest and southern states a light shade on the glass to reduce light intensity is necessary, provided this shade is removed before August 1.

Blindness

Blindness may be a combination of late planting, late pinching, too much moisture, too rich a soil and too low a temperature at bud initiation. It has been shown that if chrysanthemums are grown in temperatures much below 50° at the time of bud initiation the plants will remain vegetative and will not form flower buds. Blindness is usually associated with those varieties which flower the latter part of November or later. Not all varieties initiate buds at the same date. The late flowering varieties may not set bud until October.

To overcome blind growth keep a night temperature of 55 - 60° from September 15 on until the buds are visible. Likewise run the soil moisture low and do not feed during this period. After the buds are visible it is safe to reduce the temperature to 50°

When growing chrysanthemums for "Continuous Flowering" it is very important to maintain a temperature of 60° during the period of bud formation or blindness and poor budding will result.

Lack of Color

Pink and bronze varieties will have poor color when high temperatures prevail during the development period. We suggest that pink and bronze varieties be omitted from the seasons when high temperatures prevail.

Petal Burn

When blooming chrysanthemums during high temperatures and high light intensity it is advisable to cover the beds with a cheesecloth stretched about 18 inches above the top of the developing blooms. This covering will also help keep dirt off the open blooms. Sunburn sometimes is confused with flower ray blight which is caused by Botrytis. Botrytis is more abundant during periods of high humidity and low temperatures.

SHIPPING FLOWERS

Packing of cut flowers should be carefully studied. The most common error is over-crowding in the shipping boxes. Not securely fastening the blooms in the box will cause bruising of the petals. Cleating or sewing the stems to the box is essential. Cushion the blooms by placing enough padded paper on the bottom of the corrugated box and between the layers of blooms. Wrap the pompons with a loose wrapper. The wrapping paper could have the name of the grower printed on it.

Long distance shipments carry better if the cut flowers are packed dry. Reduction of temperature is accomplished by precooling the packed cut flowers.



Packing Shed with Ample Room



Cultural Pointers SUPPORTS

Standards and disbuds are usually staked up by means of a support, starting when the plants are a foot high. The simplest method is to run a wire overhead along each row and tie a string from the base of the plant to this wire. This method eliminates the need of tying the stem at intervals to the support since the string may be twined in and out of the leaves of the stem. The quickest means of support is the use of galvanized wire stakes, which are fastened by patented clips to the wire overhead. Several string ties are necessary to keep the stem in position. In some cases the same type of support that is used in supporting carnations with wire and string has been used satisfactorily.

Pompons are usually supported by the string and wire method similar to that used for snapdragons and carnations. Two layers of wires are necessary to give the pompons good support. When growing out of doors or in cloth houses heavier wire is necessary to give proper support because moisture often collects in the open blooms accounting for the extra weight requiring very strong supports.

SOUTHERN CULTURE

It is true the material presented in this manual is primarily from experiences gathered for the northern part of United States. Yet many of the pointers are similar for all parts of the country.

We have noted that the early flowering varieties from October 15 to November 1 flower approximately one week later in the southern states while those flowering naturally November 15 to December 1 bloom one week earlier than the dates given in this manual. Last Pinch dates will have to be governed accordingly.

When shading, it has been suggested that the black cloth be placed on the beds late in the evening 7 or 8 P.M. and left on until 8 or 9 A.M. Shading the usual time traps the excessive heat under the cloth and appears to affect foliage and flower buds. Pink and bronze varieties used for shading and early normal production fade to inferior colors.

During the months of July and August little growth may be expected, therefore fertilization should be kept to a minimum. When the nights get cooler in September, October and November, growth is more rapid and the fertilization program should be stepped up accordingly.

The young plants should be illuminated until May 1 to prevent premature flower buds.

CLOTH HOUSES

Much has been written about the construction and care of the cloth house. It seems that this subject is well taken care of, although there are a few new ideas that should be mentioned.

To grow quality stock it is necessary to use some type of covering such as aster cloth, onion bag or saran. Saran is manufactured by Dow Chemical Co. and is a plastic that will outlive copper screening. There are several colors of this material and the natural colored saran produced better quality pompons than did the green colored material. The amber colored saran allows more light to reach the plants. The plants growing under natural colored saran required twice the amount of water as did those under the green cloth. The important difference is that higher quality stock was produced under the natural colored saran.



Cloth House Made of Natural Colored Saran



Continuous Flowering of Chrysanthemums

Since the advent of day-length and temperature control we have seen chrysanthemum cut flowers on the markets every month since 1946, thanks to our never-tiring research workers in various federal and state institutions. Season has been eliminated and the flowering time can be accurately controlled.

Daylength Control

It has been known that the days are short enough for bud formation around September 20. This will vary somewhat depending upon your location in the States. To prevent flower buds from forming it is desirable to lengthen the day with additional light starting August 10. When one is using black cloth to reduce the length of the day the treatment can be discontinued September 20.

Similarly in the spring the days are too long for further bud formation starting April 15. To prevent bud formation light the plants until April 20. If you want bud formation start shading March 15, or a little earlier if you are in the extreme southern states.

Lighting

The use of 100 watt lamps with reflectors spaced at six foot intervals, three feet above the plants, is sufficient light to prohibit bud formation. The light intensity must be 10 foot candles to prevent bud set. Several schools of thought exist on the time to start the additional light. One group prefers to light from midnight on while the other suggests that lights be turned on from about 1 hour after sundown. The number of hours to operate the lights is as follows:

August	1 hour
September and April	2 hours
October and March	3 hours
November and February	4 hours
December and January	5 hours

Yoder Brothers have found that they could overcome poor spray formation by reducing the hours of lighting to one-third during the last third of the lighting period. That is, if the lighting period is 60 days, the last one-third or the last 20 days would receive only one-third of the light normally given in that particular month. This will open up the sprays that normally are clubbed together.

Shading

Use a good durable **Black Cloth** which when applied will reduce the light intensity to 2 foot candles or less. More light intensity than this will result in delayed flowering and unevenness of bloom.

The cloth should be applied at 5 P.M. and removed at 8 A.M. Continue covering each evening on pompons until the latest buds show color and most of the flowers are well developed. For large flowering varieties shading can be discontinued after all flowering buds have attained the diameter of approximately one-half inch.

Be sure that covering is complete on all benches shaded, as any leaks in light will cause uneven spots in the bench at blooming time.

Black cloth should be applied each evening although missing one night a week will give fair results but delayed flowering results when cloth is not applied each evening.

Temperature Control

For bud formation a minimum temperature of 60 - 65 degrees should be maintained. During the period of elongation or where bud formation is not wanted a night temperature near 60 degrees is ideal. When black cloth is started raise the night temperature to 60 degrees until color shows, and then it can be lowered.

When growing a single bench of pompons in a cool house, it has been a problem how to increase the temperature necessary for bud set. A simple method is when applying black cloth allow the cloth to drop to the floor on each side of the bench. Turn on the heat lines under that bench and you will find that a 60 to 65 degree temperature can be maintained.

Timing

Rooted cuttings previously grown under additional light should be planted directly into the permanent location and pinched 21 days later. A soft pinch should be made. The period of elongation or the period which must have additional light will vary with the planting date. October planted cuttings will require a longer period to attain their desired height as compared with February planted cuttings. Therefore, we have added a schedule of continuous flowering of chrysanthemums. In this schedule you will find the date of planting, the date of pinch, which in all cases is 21 days after planting. The date the lights should be off as well as the shading date are found in this schedule. Remember to apply additional light from the day you plant until the respective date given under the heading **Lights Off**.



Continuous Flowering Schedule

Variety	Plant	Pinch	Lights Off	Shade	Bloom
Champagne Cinderella Goldsmith Omega Yellow Cameo Yellow L. I. Beauty Cameo Cordova L. I. Beauty Silversmith White Valencia Dark Valencia Bourbon Bronze Goldsmith Festival Holiday Merrymaker	August 5	August 26	October 7	.....	January 1
Champagne Cinderella Goldsmith Omega Yellow Cameo Yellow L. I. Beauty Cameo Cordova L. I. Beauty Silversmith White Valencia Dark Valencia Bourbon Bronze Goldsmith Festival Holiday Merrymaker	August 14	Sept. 4	October 21	.....	January 15
Champagne Cinderella Goldsmith Omega Yellow Cameo Yellow L. I. Beauty Cameo Cordova L. I. Beauty Silversmith White Valencia Dark Valencia Bourbon Bronze Goldsmith Festival Holiday Merrymaker	August 27	Sept. 17	November 7	.....	February 1

REMEMBER TO APPLY ADDITIONAL LIGHT FROM THE DAY YOU PLANT UNTIL THE RESPECTIVE DATE GIVEN UNDER THE HEADING **LIGHTS OFF**.



Continuous Flowering Schedule

Variety	Plant	Pinch	Lights Off	Shade	Bloom
Champagne Cinderella Goldsmith Omega Yellow Cameo Yellow L. I. Beauty Cameo Cordova L. I. Beauty Silversmith White Valencia Dark Valencia Bourbon Bronze Goldsmith Festival Holiday Merrymaker	Sept. 7	Sept. 28	Nov. 21	.....	Feb. 15
Champagne Cinderella Goldsmith Omega Yellow Cameo Yellow L. I. Beauty Cameo Cordova L. I. Beauty Silversmith White Valencia Dark Valencia Bourbon Bronze Goldsmith Festival Holiday Merrymaker	Sept. 26	Oct. 10	Dec. 5	.....	March 1
Champagne Cinderella Goldsmith Omega Yellow Cameo Yellow L. I. Beauty Cameo Cordova L. I. Beauty Silversmith White Valencia Dark Valencia Bourbon Bronze Goldsmith Festival Holiday Merrymaker	Oct. 12	Oct. 26	Dec. 19	.....	March 15

REMEMBER TO APPLY ADDITIONAL LIGHT FROM THE DAY YOU PLANT UNTIL THE RESPECTIVE DATE GIVEN UNDER THE HEADING **LIGHTS OFF**.



Continuous Flowering Schedule

Variety	Plant	Pinch	Lights Off	Shade	Bloom	
Constellation Gold Coast Golden Herald Yellow Arcadia Ballerina	Oct. 27	Nov. 17	Jan. 25	} April 1	
Good News Yellow Mefo Yellow Queen Betsy Ross Jean Elizabeth Mefo Silver Sheen	Nov. 17	NO	Jan. 25	.....	
Golden Mensa Yellow Shasta Encore Little America Popcorn Shasta White Mensa Linda Lou Masterpiece Soprano Thyra Bronze Masterpiece Red Rust	Oct. 27	Nov. 17	Jan. 15	.....	
Constellation Gold Coast Golden Herald Sunray Yellow Arcadia Ballerina	Nov. 17	Dec. 4	Feb. 8	March 15		} April 15
Good News Yellow Mefo Yellow Queen Betsy Ross Jean Elizabeth Mefo Silver Sheen Indianapolis White	Dec. 4	NO	Feb. 8	March 15		
Golden Mensa Yellow Shasta Encore Little America Popcorn Shasta White Mensa Linda Lou Masterpiece Soprano Thyra Bronze Masterpiece Red Rust	Nov. 17	Dec. 4	Jan. 29	March 5		

REMEMBER TO APPLY ADDITIONAL LIGHT FROM THE DAY YOU PLANT UNTIL THE RESPECTIVE DATE GIVEN UNDER THE HEADING **LIGHTS OFF**.



Continuous Flowering Schedule

Variety	Plant	Pinch	Lights Off	Shade	Bloom	
Constellation Gold Coast Golden Herald Yellow Arcadia Pinnocchio Ballerina	Dec. 6	Dec. 27	Feb. 23	March 15	} May 1	
Good News Yellow Mefo Yellow Queen Betsy Ross Jean Elizabeth Mefo Silver Sheen Indianapolis White	Dec. 27	NO	Feb. 23	March 15		
Golden Mensa Yellow Shasta Encore Little America Popcorn Shasta White Mensa Linda Lou Masterpiece Soprano Thyra Bronze Masterpiece Red Rust	Dec. 6	Dec. 27	Feb. 13	March 5		
Constellation Gold Coast Golden Herald Sunray Yellow Arcadia Arcadia Pinocchio Ballerina	Dec. 27	Jan. 17	March 10	March 15		} May 15
Good News Yellow Mefo Yellow Queen Betsy Ross Jean Elizabeth Mefo Silver Sheen Indianapolis White	Jan. 17	NO	March 10	March 15		
Golden Mensa Yellow Shasta Encore Little America Popcorn Shasta White Mensa Linda Lou Masterpiece Soprano Thyra Bronze Masterpiece Red Rust	Dec. 27	Jan. 17	Feb. 28	March 5		

REMEMBER TO APPLY ADDITIONAL LIGHT FROM THE DAY YOU PLANT UNTIL THE RESPECTIVE DATE GIVEN UNDER THE HEADING **LIGHTS OFF.**



Continuous Flowering Schedule

Variety	Plant	Pinch	Lights Off	Shade	Bloom	
Constellation Gold Coast Golden Herald Yellow Arcadia Arcadia Pinocchio Ballerina	Jan. 20	Feb. 10	March 27	March 27'	} June 1	
Good News Yellow Mefo Yellow Queen Betsy Ross Jean Elizabeth Mefo Silver Sheen Indianapolis White	Feb. 10	NO	March 27	March 27		
Golden Mensa Yellow Shasta Encore Little America Popcorn Shasta White Mensa Linda Lou Masterpiece Soprano Thyra Bronze Masterpiece Red Rust	Jan. 20	Feb. 10	March 17	March 17		
Constellation Gold Coast Golden Herald Yellow Arcadia Pinocchio Ballerina Mary McArthur	Feb. 8	March 1	April 10	April 10		
Good News Yellow Mefo Yellow Queen Betsy Ross Jean Elizabeth Indianapolis White	March 1	NO	April 10	April 10		} June 15
Golden Mensa Yellow Shasta Encore Little America Popcorn Shasta White Mensa Linda Lou Masterpiece Soprano Thyra Rubicon	Feb. 8	March 1	March 31	March 31		

REMEMBER TO APPLY ADDITIONAL LIGHT FROM THE DAY YOU PLANT UNTIL THE RESPECTIVE DATE GIVEN UNDER THE HEADING **LIGHTS OFF.**



Continuous Flowering Schedule

Variety	Plant	Pinch	Lights Off	Shade	Bloom
Gold Coast Sunray Yellow Arcadia Caroline Yosick Mary McArthur	March 3	March 24	April 26	April 26	July 1
Good News Yellow Queen Betsy Ross Jean Elizabeth	March 24	NO	April 26	April 26	
Golden Mensa Yellow Shasta Mary L. Hall Little America Popcorn Shasta Sea Gull White Mensa Rubicon	March 3	March 24	April 16	April 16	
Gold Coast Sunray Yellow Arcadia Caroline Yosick Mary McArthur	March 17	April 10	May 8	May 8	July 15
Good News Yellow Queen Betsy Ross Jean Elizabeth	April 10	NO	May 8	May 8	
Golden Mensa Mary L. Hall Yellow Shasta Little America Popcorn Sea Gull Shasta White Mensa Rubicon	March 17	April 10	April 28	April 28	

	Plant	Pinch	Shade	
Gold Coast Irene Caroline Yosick Mary McArthur	April 4	April 25	May 27	August 1
Good News Yellow Queen Betsy Ross Jean Elizabeth	April 4	April 25	May 27	
Golden Mensa Mary L. Hall Yellow Shasta Little America Popcorn Sea Gull Shasta White Mensa Rubicon	April 4	April 25	May 17	



Continuous Flowering Schedule

Variety	Plant	Pinch	Shade	Bloom
Gold Coast Starbright Cotton Top Irene Minong Popcorn Caroline Yosick Mary McArthur	April 20	May 11	June 10	August 15
Good News Yellow Queen Betsy Ross Jean Elizabeth	April 20	May 11	June 10	
Golden Mensa Mary L. Hall Yellow Shasta Sea Gull Shasta White Mensa Rubicon	April 20	May 11	June 1	
Barcarole Gold Coast Sunray Yellow Arcadia Yellow Dot Cotton Top Irene Minong Popcorn Ballerina Caroline Yosick Mary McArthur Pink Dot Firebird Navaho Red Daisy Rubicon Seneca	May 7	May 28	June 27	September 1
Good News Yellow Queen Betsy Ross Jean Elizabeth Silver Sheen Detroit News	May 7	May 28	June 27	
Golden Mensa Mary L. Hall Yellow Shasta Little America Sea Gull Shasta White Mensa Linda Lou Butterscotch	May 7	May 28	June 17	



Continuous Flowering Schedule

Variety	Plant	Pinch	Shade	Bloom
Barcarole Gold Coast Starbright Sunray Yellow Arcadia Yellow Dot Cotton Top Pinocchio Popcorn Ballerina Caroline Yosick Mary McArthur Pink Dot Bittersweet Navaho Red Daisy Rubicon Seneca	May 21	June 11	July 11	September 15
Golden Mensa Indianapolis Yellow Betsy Ross Indianapolis White Jean Elizabeth Silver Sheen Indianapolis Pink Detroit News Indianapolis Bronze	May 21	June 11	July 11	September 15
Forty Niner Golden Chord Golden Mensa Mary L. Hall Nuggets Yellow Shasta Encore Little America Rev. Bushnell Sea Gull Shasta White Mensa Dark Bulkeley Linda Lou Masterpiece Thyra Soprano Bronze Masterpiece Butterscotch Samovar	May 21	June 11	July 1	September 15



Continuous Flowering Schedule

Variety	Plant	Pinch	Shade	Bloom
Barcarole Gold Coast Starbright Sunray Pinocchio Popcorn Ballerina Caroline Yosick Mary McArthur Pink Dot Bittersweet Navaho Red Daisy Red Rust Rubicon Seneca	June 1	June 22	July 27	} October 1
Good News Indianapolis Yellow Yellow Queen Yellow Mefo Betsy Ross Indianapolis White Jean Elizabeth Mefo Dark Orchid Queen Indianapolis Pink Detroit News Indianapolis Bronze	June 1	June 22	July 27	
Forty Niner Golden Chord Golden Mensa Mary L. Hall Princeton Yellow Shasta Encore Little America Rev. Bushnell Sea Gull Shasta White Mensa Dark Bulkeley Linda Lou Masterpiece Soprano Thyra Bronze Masterpiece Bufferscotch Red Princeton Samovar	June 1	June 22	July 17	



Continuous Flowering Schedule

Variety	Plant	Pinch	Shade	Bloom
Barcarole Gold Coast Starbright Sunray Pinocchio Popcorn Ballerina Caroline Yosick Mary McArthur Pink Dot Bittersweet Navaho Red Daisy Red Rust Rubicon Seneca	June 11	July 2	August 10	October 15
Good News Indianapolis Yellow Yellow Queen Yellow Mefo Betsy Ross Indianapolis White Jean Elizabeth Mefo Dark Orchid Queen Indianapolis Pink Detroit News Indianapolis Bronze	June 11	July 2	August 10	
Forty Niner Golden Chord Golden Mensa Mary L. Hall Princeton Yellow Shasta Encore Little America Rev. Bushnell Sea Gull Shasta White Mensa Dark Bulkeley Linda Lou Masterpiece Soprano Thyra Bronze Masterpiece Bufferscotch Red Princeton Samovar	June 11	July 2	July 31	



Chrysanthemum Pot Plant Culture

Well-grown, short chrysanthemum potted plants have been finding a ready market. To grow short, stocky plants it is necessary to follow definite cultural directions. We offer the following suggestions for your consideration:

Soil

A good fibrous silt loam directly from the field to which one-quarter by volume of well rotted manure has been added, plus an application of super phosphate will give excellent results. Steam sterilization will eliminate all weed seeds and increase the granulation of the soil. Wait seven days before planting rooted cuttings into steam sterilized soil.

Planting

Plant cuttings directly in the finishing pot. When the two-pinch method of culture is followed plant three cuttings in a six inch pot and four or five in a seven inch pot. Always plant an extra cutting in a pot when planting the variety Blazing Gold.

Watering and Humidity

After planting, water thoroughly to set the soil around the roots. Repeat this type of watering when the soil gets on the dry side. Organic matter in the soil will facilitate watering and will tend to avoid extreme fluctuations in moisture supply. Overwatering will rot the roots and cause a yellowing of the foliage. For best results grow all potted chrysanthemums under glass. Keep humidity in house by wetting down benches and walks with an occasional syringing over the plants.

Pinching

Two pinches are sufficient for a good short compact pot plant. The first pinch should be 15 days after planting followed by the second pinch 21 days after the first. If a third pinch is wanted wait another 21 days after the second pinch. When shading potted plants, two pinches are sufficient while those flowered for the natural season are often pinched three times. This means that rooted cuttings should be planted about July 15 for those who wish to flower the plants normally.

Fertilizing

The foliage should retain a bright green lustre throughout the life of the plant, and the lower leaves should never be allowed to lose their color and turn to a light green due to low fertility. A strong well grown pot plant is a well fed plant. Pot plants should be fed more often than those grown in a bench as constant leaching will lower the nutrient level in pots faster than under bench culture. Several light feedings should be made with a complete fertilizer such as Electra. This can safely be used at the rate of 1 teaspoonful per 6" pot. Last feeding should be made when the buds are forming.

Diseases and Insects

A regular spraying or fumigation with **Parathion** will control red spider, thrip, aphid and leaf tyer, the most troublesome insects affecting pot plants. If by chance plants are grown out of doors, weekly spraying with **Zerlate** or **Fermate** will prevent leaf spot.

Shading and Disbudding

Same procedure as for cut flowers. Black cloth should be new or in best of condition for very early shading to avoid delayed and uneven blooming. Continue shading until color shows on the buds. Pinch pot plants the last time the date shading is started. Disbud each shoot to one bud when buds are large enough to handle.

Plant — Pinch and Shade Method

When good stocky cuttings are planted, pinched and given short day treatment the same date, they will bloom in 66 days. Fewer blooms per plant will result as compared with the two or three pinch method. This method is gaining popularity when chrysanthemums are wanted for Christmas, Easter or Mother's Day. The cuttings should be from lighted stock. No black cloth shading is necessary from September 15 to March 15. Always grow in a 60° house as lower temperatures will cause blindness. Blazing Gold; Granite State, and Queen of Pinks will bloom in 66 days while Bonnaffon DeLuxe will require 76 days from date of potting.



Pot Plant Culture Continuous Blooming Schedule

Variety	Plant	Shade and Last Pinch Date	Start Bloom
Gold Lode Blazing Gold Granite State	May 1	June 5	August 5
Gold Lode Blazing Gold Granite State Queen of Pinks	May 15	June 20	August 20
Bonnaffon DeLuxe Bronze Masterpiece Masterpiece	May 15	June 20	September 1
Blazing Gold Granite State Little America Queen of Pinks	June 1	July 5	September 5
Bonnaffon DeLuxe Bronze Masterpiece Gypsy Masterpiece	June 1	July 5	September 15
Blazing Gold Granite State Little America Queen of Pinks	June 15	July 20	September 20
Bonnaffon DeLuxe Bronze Masterpiece Gypsy Masterpiece	June 15	July 20	September 30
Blazing Gold Granite State Little America Queen of Pinks Thyra	July 1	August 5	October 5
Bonnaffon DeLuxe Bronze Masterpiece Gypsy Masterpiece	July 1	August 5	October 15
Blazing Gold Granite State Little America Queen of Pinks Thyra	July 15	August 20	October 20
Bonnaffon DeLuxe Sun Gold Marketeer Helen Frick Beautiful Lady Red Rolinda	July 15	August 20	November 1

REMEMBER DATE OF LAST PINCH IS THE SAME AS SHADING DATE



Insects and Their Control

APHIDS, OR PLANT LICE

All aphids are true sucking insects that insert their beaks through the surface of the leaf or stem and extract the juices from within.

INJURY. The feeding of aphids causes the plants to become sickly and stunted. The leaves curl inward, and when the flower terminal is infested the blooms will be deformed. Certain varieties of chrysanthemums are more susceptible to attack than others.

CONTROL. **Nicofume Fumigation** is an easy method of controlling the black aphid but will do very little to control the green or straw colored aphids. **Benzene Hexachloride** or **Parathion** is much more effective on the very resistant green or straw colored aphids. **Vapotone** is also effective when used at higher concentrations.

CHRYSANTHEMUM LEAF MINER

The larva or maggot disfigures and weakens chrysanthemum plants by mining in the leaves. It may do considerable harm to the crop, but is easily held in check.

INJURY. The young maggots burrow in the leaf tissue, leaving the upper and lower surfaces intact. The tunnels are irregular and winding. White blotches are thus formed, which later turn brown, and the leaves may die.

CONTROL. As soon as it is noticed that any leaves are infested, they should be picked off and burned. **Nicofume** spray will kill most of the maggots before they have time to do much damage. **Parathion** or **TEPP** aerosol bombs are very effective.

CHRYSANTHEMUM MIDGE

The chrysanthemum midge is one of the most serious pests with which the grower has to deal. Under optimum conditions a little over a month is required to complete the life cycle from the egg to the adult. The eggs are reddish-orange in color and are usually deposited on the tender tips of the growth. Under favorable conditions, the eggs hatch in about three days. The larva wanders about over the surface of the leaf for a day or two before finally penetrating into the leaf.

INJURY. The midge attacks all parts of the plant but prefers the tender growth. If the infestation takes place when the plants are small, they fail to grow, although if the plants are well developed when the infestation starts, the buds blight or are deformed and the plant is rendered unsalable.

CONTROL. Clean stock should be used wherever possible. Severely infested plants should be pulled up and burned. Nightly fumigation with **Calcium cyanide** or **Nicofume** pressure fumigators for 28 consecutive days will give good control. **Nicotine Dust** is also useful in keeping the plants covered and is especially useful when used in combination with fumigation. **Sodium selenate** is effective when applied in liquid form $\frac{1}{4}$ gram per square foot after plants are well established. **Parathion** either as aerosol or spray is very effective.



Aphids



Midge Injury to Leaves and Buds



Insects and Their Control

CORN EAR WORM

The corn ear worm is a green to brown, nearly smooth caterpillar, often mistaken for a cutworm when found within the buds or on the open flowers.

INJURY. It is very destructive to the opening buds, for it feeds on their petals and other parts, deforming if not entirely ruining the flowers.

CONTROL. If the attacked plants are blooming, spraying is out of the question, but thorough treatment with a 3 or 5% **D.D.T.** dust is recommended. After they have worked their way into the buds and are found to be feeding on the open flowers, hand-picking is the only remedy. Spraying the plants with **Deenate 50W** will control them before the color shows. **Parathion** fumigation will also keep them under control.

CUTWORMS

The larva is dull colored and from one to more than two inches in length. They are most active at night, and usually spend the day coiled up just under the surface of the soil at the base of the plant. They should not be confused with the corn ear worm which cannot be controlled by poison baits.

INJURY. Cutworms obtain their food by biting out sections of the leaf, stem or bud. Various species attack different parts of the plant. The one that is most damaging climbs to the top of the stem and eats into the flower buds.

CONTROL. Those cutworms that feed on the foliage can best be controlled with **Deenate 50W** spray using 1½ pounds to 100 gallons of water. **Parathion** has been suggested as a good control measure, more effective as a spray.

GREENHOUSE LEAF TYER

It gets its name from its habit of spinning light webs inclosing two or more leaves or tying together the parts of a single leaf. This caterpillar is very active, and when disturbed will wriggle off the leaf, often backwards, lowering itself on a silk-like strand.

INJURY. When first hatched, the larvae eat out shallow holes on the under side of the leaves. As they grow, they enlarge these holes but usually do not cut through to the upper surface. The result is that the leaves become skeletonized.

CONTROL. The best poison to control the larvae is **Deenate 50W**, either in the form of a dust or a spray. For liquid spray use 1½ pounds of **Deenate 50W** to 100 gallons of water. Regular fumigations with **Parathion** will keep the leaf tyer under control.

MEALY BUGS

Mealy bugs are small, sluggish, whitish, soft bodied insects, measuring up to ¼ inch long, found in clusters on the undersides of the leaves or in the leaf axils.

INJURY. This pest sucks the juices from the stems and leaves, discoloring and deforming the foliage.

CONTROL. **Parathion** is the most effective. Regular fumigations with **Calcium Cyanide** will aid in keeping mealy bugs in check.



Corn Ear Worm Damage



Leaf Tyer



Mealy Bugs



Insects and Their Control

MITES

Cyclamen mite and broad mite are often found on the same plants at the same time. Broad mite could pass through a complete generation in 4 to 5 days at 70 to 80 degrees while the Cyclamen mite will take 4 to 5 times longer.

INJURY. Infested leaves become deformed, curl from the outside inward, and wrinkle so that pockets and pit-like depressions are formed. When the infestation is severe, the mites collect about the buds, causing them to blight.

CONTROL. Fumigating with **Parathion** is very effective and easy to apply. **Vapotone** containing **HETP** has given good control. **Sodium Selenate** is effective when applied in liquid form $\frac{1}{4}$ gram per square foot after plants are well established. **P40** used at the rate of 3 pounds per hundred square feet is another way to use sodium selenate.

RED SPIDERS

There are several species of red spiders that attack the chrysanthemum. They vary in color through yellow, orange and red. The body is oval in outline and bears eight well-developed legs.

INJURY. Red spiders pierce the epidermis of the leaf and draw the liquid contents from the cells, causing the leaf to turn pale around the injured portion. They prefer to collect on the under surfaces of the leaves, which they cover with silken threads.

CONTROL. **Parathion** or **TEPP** bombs are most effective and easiest to apply. **HEPT** or **TEPP** contained in insecticides such as **Vapotone** are by far the most effective on red spider. Moisture is detrimental to the development of the red spiders and frequent syringing washes them and their eggs off the plants. **Sodium selenate** is effective when applied in liquid form $\frac{1}{4}$ gram per square foot or **P40** at 3 pounds per 100 sq. ft. after plants are well established, especially desirable for cloth house operators, will also control foliar nematodes.

SYMPHYLIDS

Symphylids are small white creatures about $\frac{1}{8}$ to $\frac{3}{16}$ inches long. About 40-60 days are necessary for the completion of the life cycle.

INJURY. Symphylids destroy the fine root hairs and small rootlets, thus stunting the plants and often killing them outright.

CONTROL. If possible construct raised bench. Steam sterilization has given fair control. **Dowfume G** or **Dow MC2** when properly applied will give good control. **Isotox** (15% benzene hexachloride) or 15% wettable powder of **Parathion** has been used as follows with no apparent damage: Place 3 ounces in 30 gallons of water and apply to 100 sq. ft. of bench space. Several applications 2-3 weeks apart may be necessary for a complete clean-up.

SOWBUGS

INJURY. Sowbugs often become so plentiful in the greenhouse that they eat the newly planted cuttings at the base

CONTROL. Any of the many poison baits will give partial control but a complete spraying with **DDT** under the benches has given excellent control. **Deenate 50W** will give complete control.



Red Spider Injury



Symphylids Enlarged 10x



Insects and Their Control

TARNISHED PLANT BUGS

The tarnished plant bug or sting fly comes into the greenhouse through open doors and ventilators in late summer or early fall and does considerable harm to this crop. Chrysanthemums growing in the open are frequently affected. Varieties such as Mary L. Hall and Sea Gull are attacked to a greater extent than other varieties.

INJURY. It has sucking mouth parts and obtains its food by inserting its long, slender beak into the plant tissues and sucking up the contents of the injured cells, apparently injecting saliva, which causes the death of the tissue in the immediate vicinity. The stem is often slightly bent and the terminal growth is malformed because of this injection.

CONTROL. Early morning spraying or dusting with any of the pyrethrum materials will kill those bugs that are present but this will have to be done each day for complete eradication. **Deenate 50W** has been giving fair control but again this insecticide is best used as a contact. **Parathion** fumigation will control this insect in the greenhouse.

TERMITES

Termites are not ants, though often called white ants. The food of termites is wood or cellulose. Soil inhabiting forms are the most common in the greenhouse.

INJURY. Termites sometimes injure chrysanthemum plants by working up the center of the plant and hollowing out the stem. This injury will eventually kill the plant.

CONTROL. **Isotox** (15% benzene hexachloride) or the 15% wettable powder of **Parathion** has been used as follows with no apparent damage: Place 3 ounces in 30 gallons of water and apply to 100 sq. ft. of bench space.

THRIPS

The chrysanthemum is usually attacked by one or more species of thrips. These small, narrow-bodied, active insects which range in color from yellow to brown or almost black, injure both the leaves and the blossoms.

INJURY. Thrips have mouth parts that are fitted for piercing and scraping the leaf surface and for sucking the juices and other cell contents. The upper surface of the foliage is covered with whitish blotches while minute black specks appear on the lower surface. Unless a constant watch is kept on the plants, and control measures properly executed, thrips are capable of causing severe injury within a short time.

CONTROL. **Deenate 50W** used at the rate of 1-1½ pounds to 100 gallons of water is a very effective control. Other insecticides containing **Benzene Hexachloride** are also recommended. **Parathion** will control the chrysanthemum and onion thrips.



Tarnished Plant Bug



Thrip Injury



Pests and Their Control

COLLAR ROT or STEM ROT

SYMPTOMS. The area of stem just at the soil level will show dark colorings first. The entire stem will be girdled and eventually the plant will turn yellow and die. Usually caused by the common damping off organisms such as Rhiztonia, Fusarium or Pythium. More prevalent when temperature and humidity are high.

CONTROL. Do not plant cuttings that have been affected with damping off. Remove all affected plants when noticed. Do not keep the soil too moist. Run a lower humidity if possible.

FOLIAR NEMATODE

The spread of this pest has been very rapid in recent years owing to the increased trade in chrysanthemums, and the ease with which the nematode is transported in plants and cuttings. Too few growers have become familiar with this pest and consequently no effort has been put forth to control it.

SYMPTOMS. The leaves attacked become blotched, turn at first greenish-yellow, then brownish, later gray and finally black until the entire leaf dies and hangs down on the stem. Under conditions of high humidity, both in the open during a wet season and under glass owing to excessive watering, the spread of the pest may be extremely rapid.

CONTROL. Sodium Selenate applied in liquid form to the soil at the rate of 1/4 gram per square foot of bed area will give good control. Dissolve 1 pound of sodium selenate into 4 1/2 gallons of water, then take one quart of this stock solution and add to 25 gallons of water and this should be applied on 100 square feet of bench surface. One pound of sodium selenate will treat 1800 square feet. The safest method is to make 2 applications at the 1/8 gram rate a week or so apart. P40 applied at the rate of 3 pounds per 100 square feet has given good control. Wait 2 to 4 weeks after benching before applying. It is better to apply P40 in 2 applications, 1 1/2 pounds each time, 7 to 10 days apart. The latest findings show that foliar nematodes can be controlled with Parathion either as an aerosol or liquid spray.

MILDEW

SYMPTOMS. Whitish powdery growth on upper surface of leaves.

CONTROL. Spray at regular weekly intervals with a good Wettable Sulfur, 1 lb. per 100 gallons of water to which a good commercial spreader has been added. Fermate or Zerlate, 1 ounce to 4 gallons of water is effective.

BIOLOGY OF THE FOLIAR NEMATODE



Eelworms becoming active and commencing their migration from the ground up the outside of the stem and leaf-stalks into the basal leaves.
(Spring)

Eelworms entering leaf through the stomata.
(Spring-Summer)

Eelworms feeding and breeding in leaves and migrating upwards from leaf to leaf.
(Spring-Autumn)

Eelworms overwintering in soil, dead leaves and in basal buds.
(Winter)

P.S.S.



Diseases and Their Control

RAY BLIGHT

SYMPTOMS. The petals first show little spots and then the entire petal begins to rot. May be caused by Botrytis or Ascochyta. Botrytis is spread primarily by splashed water.

CONTROL. It is controlled by lowering humidity or spraying plants with **Parzate** when they show color.

ROOT KNOT NEMATODE

SYMPTOMS. The nematodes or eelworms bore into the roots of the plants and cause knots or galls to develop on the root systems. As a result the plants are weak, yellowish and stunted in growth.

CONTROL. **Steam sterilization** of the soil is very effective in eliminating the nematodes. **Dowfume G** is a good soil fumigation that will kill nematodes and not do any damage to the surrounding plants.

RUST

SYMPTOMS. Chocolate brown powdery pustules on lower surface of the leaves.

CONTROL. **Fermate**, or **Parzate**, 1 ounce to 4 gallons of water is most effective.

SEPTORIA LEAF SPOT OR LEAF BLIGHT

SYMPTOMS. Distinct circular spots on the leaves. These are greyish brown in color and become brittle in the center. Affected leaves may turn yellow and die. More prevalent in the open. Some varieties are more susceptible than others. Sea Gull is very susceptible.

CONTROL. When cuttings are received dunk the tops into **Fermate** (2 tablespoonfuls to a gallon). Spray the plants with **Zerlate** or **Fermate** 1 ounce to 4 gallons of water plus $\frac{1}{3}$ teaspoonful of **DuPont Spreader Sticker** every ten to fourteen days. Cloth house mums should be kept covered until the buds can be seen.

VERTICILLIUM WILT OR SEIDEWITZ DISEASE

SYMPTOMS. Margins of leaves turn yellow and eventually wilt or dry up. This begins at base of plant and works up the stems. May affect one side of a stem or plant more than the other. No distinct spots. Varieties vary in resistance to this disease.

CONTROL. Verticillium wilt can be avoided by purchasing our disease free cuttings produced from **cultured stock**. It is also necessary to plant only into sterilized soil.



Dodder Growing on Mums



Septoria Leaf Spot



Diseases and Their Control

VIRUSES

The word "virus" is being referred to by the medical profession as well as by the florists and a short explanation of virus should prove of interest.

Viruses of the chrysanthemum are considered to be infectious; that is they can be transmitted to a healthy plant only by contact with an infected plant. They are not carried in the soil, water or air as are other diseases caused by fungi and bacteria.

The virus particles cannot be seen by the most powerful microscopes. Most of them will pass through bacterial filters. They respond like living organisms. They are always present in the sap of diseased plants and can be transmitted to a healthy plant through wounds or by mechanical means. The chrysanthemum is known to be affected with three viruses, namely yellows, mosaic and stunt. Stunt is the only one that has caused much concern. It has been found that aphids as well as mechanical handling will cause stunt to spread.

Once a plant is infected with a virus it usually always remains affected. To define a virus the following is as good as any: A virus is a protein which requires the presence of living cells for multiplication and it causes changes in the structure and functions of living cells.

STUNT

SYMPTOMS. Young foliage may be paler than normal and has a tendency to more upright growth rather than growing at a wide angle with the stem. Diseased plants show stunting in growth after they have been in the soil a few weeks, and at maturity they may in some cases be less than half as tall as normal. Buds may form and blossoms open a week or 10 days ahead of those on healthy plants, although on some varieties stunted plants will bloom after the normal plants. Varieties possessing red pigment (the bronzes, pinks and reds) the red component of the color is badly bleached. With most varieties the blossoms are greatly reduced in size.

CONTROL. Knowing that stunt is a virus and that it can be spread by insects as well as manual operations the following recommendations for its control are necessary. (1) Select only the healthiest plants in June or July for stock purposes. (2) Use a sterile knife when removing cuttings or pinching the plants. (3) Keep all insects from these plants by isolation and use of good insecticides. (4) Rogue out all plants from time to time that look the least bit weaker. (5) Be careful not to bruise or handle the plants. (6) Use single plant selection procedure and keep case history on each clon. (7) Do not attempt to increase population until mother block of stock plants is entirely free from diseased plants for at least two generations.

Realizing that such a procedure to keep stock clean from stunt is very expensive and that all growers cannot carry out these control measures it is therefore, necessary for the propagators of chrysanthemum cuttings to carry out this extreme control measure.



Stunt in Harvester

DODDER

SYMPTOMS. Dodder is a parasitic twiner, bearing clusters of small flowers. They are leafless annuals, with very slender yellow, white or red stems, which become attached to the plant by means of root-like suckers. Dodder is occasionally found on chrysanthemums and will cause a complete loss of crop.

CONTROL. Dodder is common in low, weedy places and may be carried into the greenhouse in the soil or manure. Soil sterilization is the only prevention. After dodder is attached to the plants remove the affected plants and burn.



Newer Insecticides

Parathion

Parathion, as an insecticide, was discovered by chemists and entomologists of the I. G. Farben Corp. in Germany during the war, as a result of preparing and testing over 300 phosphorus compounds, following earlier work on phosphorus-fluorine compounds for war gases.

This new insecticide shows promise of being the most important material yet discovered for greenhouse pest control. **Parathion** remains effective for a week or more both as a contact and stomach poison. This continued killing effect is very important in giving better control of many pests with fewer applications.

Parathion aerosol is very effective against many of the pests attacking chrysanthemums and it is safe on all varieties listed in this manual. If moisture is present on the foliage or bloom, a burn is certain. **Parathion** aerosol will give control of red spiders, mites, black aphids, green aphids, the straw colored aphids, thrips, greenhouse leaf tyers, mealy bugs and the leaf miners.

The **Parathion** aerosol is applied in the same manner as the HEPT aerosol, through an applicator consisting of a flexible hose, brass rod and oil burner nozzle, directing the aerosol mist into the air above the plants. A gas mask and protective clothing should be used when applying this insecticide.

Greatest effectiveness is obtained with temperatures of 75°F or above at the time of application and with vents kept closed for four hours, although excellent kills have been secured at temperatures as low as 65° and with vents closed for only two hours. Dr. Blauvelt, Cornell University, reports that parathion aerosol was applied with safety to many commercial greenhouse crops.

Parathion Spray

To use **Parathion** as a spray use the 15% wettable powder at the rate of 1 pound per 100 gallons of water. This form of Parathion is just as effective on the same pests as the Parathion aerosol. Even more care should be followed in using Parathion as a spray. Be careful to cover all skin, especially hands and always have mask on when spraying. Sprays are useful for cleaning up spot infestation or on crops out of doors.

CULTURED STOCK

Through the development of science your chrysanthemum cuttings have all been grown from stock that has been cultured to determine the presence or absence of the fungus that causes Verticillium Wilt or more commonly referred to as Seidewitz Disease. The culturing of cutting is to place bits of the stem of a cutting into the gelatine-like agar medium which is used for growing fungi. If the tissue is not infected, no growth of Verticillium develops. As each cutting is cultured it is placed in sterile propagating benches spaced six inches each way. After 10 days of incubating the agar plates one can determine if the wilt organism is present in the tissue. All the cuttings that show the presence of Verticillium are discarded and only those that show a negative reading are saved and grown into stock plants. This clean stock must be grown under sterile conditions at all times as cuttings can be easily contaminated when planted into soil that has the Verticillium organism present.

Verticillium wilt is one of the worst **diseases** of the chrysanthemum. If you obtain cuttings propagated from cultured stock and provided you grow your plants in clean soil this disease should not be of any trouble to you.



Popcorn—Early White Pompon



Use of Parathion Aerosol
with Proper Dress for Applying



Novelty Chrysanthemums

YELLOW

STARBRIGHT

Early large golden yellow single. Good for cloth house. Blooms naturally October 25.

GOLDEN CHORD

Intermediate golden yellow pompon, blooming November 10. Very high quality flower.

FORTY-NINER

Flowering November 15, this round golden yellow pompon is one of the best for a competitive market. Excellent growth and should be used for late September and October shading program.

GOLDEN HARVEST

A good keeping deep gold small pompon with Yellow Lakme growth habits. Blooms last of November and first week of December.

CHAMPAGNE

Yellow daisy with 2½ inch diameter bloom. Growth habit similar to Cameo. A very high quality bloom with good production. One of the better for late flowering.

CINDERELLA

Flat, yellow single flowering December 5. No tendency to blindness.

YELLOW LONG ISLAND BEAUTY

A good yellow sport of Long Island Beauty. Should find a place for late yellow disbud.

PINK

BALLERINA

Large pink single. Good for early cloth house shading and particularly for June flowering. Best with some disbudding. Better form and color than October Pink. Matures November 1.

SOPRANO

Intermediate pink single. Flowers same time as Brocade. A good replacement for that variety. Excellent for continuous flowering.

PINK LONG ISLAND BEAUTY

A good pink sport from Long Island Beauty. Ray petals are pink with golden yellow cushion. Good for disbudding.

DEFIANCE

Decorative pompon of true orchid pink. Has a green immature center that makes a pleasing color. Growth similar to Prosperity. Matures December 20.

BRONZE

BUTTERSCOTCH

A high quality hard pompon, golden bronze in color, and intermediate in size. Blooms November 5. Slightly susceptible to Verticillium wilt. Excellent for the cloth house.

RUBICON

Early bronze red decorative to flower with Mary McArthur in July, August and early September. Only bronze recommended for early shading.

SAMOVAR

A decorative rosewood bronze, good for shading or naturally. A good variety for September and October flowering. Matures November 10.

BOURBON

Rust bronze single with 3 inch blooms, maturing November 20. Bloom is flat with broad petals. Has a good growth habit and will produce much higher than Carnelia.

GALAXY

Intermediate bronze single with wide petals and a 2½ inch flower. Matures December 5 with Viking but has an improved growth habit. A very useful bronze color that should command attention.



Novelty Chrysanthemums

WHITE

POPCORN

A consistently high producing white pompon, intermediate size. Responds exceptionally well to shading. Flower completely double. Resistant foliage. Will pink slightly when flowered in cloth house in October.

ENCORE

Intermediate pure white pompon. Requires 76 days from shade to bloom. Maturing naturally November 5. Good white for late September and October in the cloth house.

MOONGLOW

Intermediate white pompon, with high quality flowers. Its natural season is November 15 finishes just ahead of Seafoam.

CRYSTAL BEAUTY

A large solid pure white pompon, perfect for all around use. Matures November 25 - 30. Tall and vigorous with large foliage.

WHITE VALENCIA

A pure white sport from Valencia. Habit identical to its parent. A white single should be welcome for this season.

SILVERSMITH

Large, flat white decorative. Matures December 10. Strong, free growing with no tendency toward blindness. First pure white pompon for early December.

SNOWCREST

An intermediate solid white pompon with a green immature center, full rounded form and excellent substance. Matures December 12. Good keeper.

SNOWCAP

Intermediate formal type white pompon maturing December 15. Best description is a Vesper plant with Omega growth habits. Bloom 2½ inches in diameter. No tendency toward blindness. A much needed variety.

RED

FESTIVAL

Small red single for Thanksgiving. The earliest of a group of outstanding red singles in which the growth habit and production is greatly improved over that of varieties listed in the past. Growth slightly shorter than most singles.

HOLIDAY

Wide petaled red single flowering December 15. Has a tall, semi-vegetative growth habit. Should replace Sarong. Excellent color for Christmas.

MERRYMAKER

Crimson red single for December 20. Foliage is not susceptible to sprays as is Christmas Star. A good replacement for Christmas Star with little larger and a better flower.

SPIDER TYPE

QUEEN'S LACE

A November 1 white spider. Requires 66 days from shade to bloom similar to Silver Sheen. An excellent addition for June flowering program. Stem is stiff and flower is very durable.



Large Flowering Varieties

YELLOW

Name	Last Pinch	Height	Select Bud	Flowering Date	50 per 50	100-450 per 100	500-2450 per 100	2500 up per 100
Gold Lode.....	July 5	Med.	Aug. 25	Oct. 15	\$2.50	\$4.50	\$4.00	\$3.50
Mrs. Kidder.....	July 12	Med.	Aug. 25	Oct. 20	2.50	4.50	4.00	3.50
Blazing Gold.....	July 12	Short	Aug. 25	Oct. 25	3.00	5.40	4.80	4.20
Sunglow.....	July 12	Med.	Aug. 25	Oct. 25	2.75	4.95	4.40	3.85
Yellow Ambassador.....	July 12	Med.	Aug. 25	Oct. 25	2.75	5.00	4.50	4.00
Good News.....	July 16	Med.	Aug. 30	Nov. 5	3.00	5.40	4.80	4.20
Indianapolis Yellow.....	July 19	Med.	Sept. 5	Nov. 8	3.00	5.40	4.80	4.20
Yellow Queen.....	July 20	Med.	Sept. 8	Nov. 10	3.50	6.30	5.60	4.90
Yellow Monument.....	July 22	Med.	Sept. 10	Nov. 15	2.50	4.50	4.00	3.50
Bonnaffon Deluxe.....	July 25	Short	Sept. 20	Nov. 20	2.25	4.05	3.60	3.15
Friendly Rival.....	July 25	Med.	Sept. 20	Nov. 20	2.75	4.95	4.40	3.85
Yellow Mefo.....	July 25	Med.	Sept. 20	Nov. 20	3.00	5.40	4.80	4.20
Harvester.....	July 28	Tall	Sept. 25	Nov. 23	3.50	6.30	5.60	4.90
Marie DePetris.....	July 28	Short	Sept. 25	Nov. 23	2.75	4.95	4.40	3.85
Yellow Chattanooga.....	July 28	Tall	Sept. 25	Nov. 25	2.75	4.95	4.40	3.85
Golden Pearson.....	July 28	Tall	Sept. 30	Nov. 25	2.50	4.50	4.00	3.50
Sun Gold.....	July 28	Short	Sept. 30	Nov. 25	2.75	5.00	4.50	4.00
Golden Mrs. Ross.....	July 31	Tall	Sept. 30	Dec. 3	2.50	4.50	4.00	3.50
Golden Mistletoe.....	Aug. 4	Med.	Sept. 30	Dec. 10	2.50	4.50	4.00	3.50
Tobin's Yellow.....	Aug. 10	Short	Sept. 30	Dec. 15	3.25	5.85	5.20	4.55
Meteore.....	Aug. 10	Med.	Sept. 30	Dec. 15	3.50	6.30	5.60	4.90

WHITE

Silver Sheen.....	July 12	Med.	Aug. 30	Oct. 20	2.75	4.95	4.40	3.85
Ambassador.....	July 12	Med.	Aug. 30	Oct. 25	2.75	5.00	4.50	4.00
Albatross.....	July 16	Med.	Aug. 30	Nov. 1	2.75	4.95	4.40	3.85
Betsy Ross.....	July 16	Med.	Aug. 30	Nov. 1	2.75	4.95	4.40	3.85
Indianapolis White.....	July 19	Med.	Sept. 5	Nov. 8	3.00	5.40	4.80	4.20
Jean Elizabeth.....	July 20	Med.	Sept. 8	Nov. 10	3.25	5.85	5.20	4.55
Monument.....	July 22	Med.	Sept. 10	Nov. 15	2.50	4.50	4.00	3.50
Marketeer.....	July 25	Short	Sept. 15	Nov. 18	2.75	4.95	4.40	3.85
Mefo.....	July 25	Med.	Sept. 20	Nov. 20	3.00	5.40	4.80	4.20
Chattanooga.....	July 28	Tall	Sept. 30	Nov. 25	2.75	4.95	4.40	3.85
December Glory.....	July 31	Med.	Sept. 30	Dec. 1	2.75	4.95	4.40	3.85
Margaret Moeller.....	July 31	Short	Sept. 30	Dec. 5	2.75	4.95	4.40	3.85
White Mistletoe.....	Aug. 4	Med.	Sept. 30	Dec. 10	2.50	4.50	4.00	3.50
Smith's Late White.....	Aug. 10	Short	Sept. 30	Dec. 15	3.25	5.85	5.20	4.55

Minimum Order 50 Cuttings of a Variety



Large Flowering Varieties

BRONZE and RED

<u>Name</u>	<u>Last Pinch</u>	<u>Height</u>	<u>Select Bud</u>	<u>Flowering Date</u>	<u>50 per 50</u>	<u>100-450 per 100</u>	<u>500-2450 per 100</u>	<u>2500 up per 100</u>
Detroit News.....	July 16	Med.	Aug. 30	Nov. 5	\$3.00	\$5.40	\$4.80	\$4.20
Indianapolis Bronze.....	July 19	Med.	Sept. 5	Nov. 8	3.00	5.40	4.80	4.20
Anaconda.....	July 19	Tall	Sept. 10	Nov. 10	3.00	5.40	4.80	4.20
Garnet King.....	July 22	Med.	Sept. 15	Nov. 15	3.00	5.50	5.00	4.50
Mrs. Roy.....	July 22	Short	Sept. 15	Nov. 15	3.00	5.40	4.80	4.20
Gladys Pearson.....	July 28	Tall	Sept. 30	Nov. 25	2.50	4.50	4.00	3.50
Oak Leaf.....	July 28	Tall	Sept. 30	Nov. 25	2.50	4.50	4.00	3.50
Bronze Mistletoe.....	Aug. 4	Med.	Sept. 30	Dec. 10	2.50	4.50	4.00	3.50

PINK

Pink Chief.....	July 5	Tall	Aug. 25	Oct. 15	2.75	4.95	4.40	3.85
J. W. Prince.....	July 16	Short	Aug. 30	Nov. 5	2.75	4.95	4.40	3.85
Indianapolis Pink.....	July 19	Med.	Sept. 5	Nov. 8	3.00	5.40	4.80	4.20
Dark Orchid Queen.....	July 20	Med.	Sept. 8	Nov. 10	3.50	6.30	5.60	4.90
Orchid Queen.....	July 20	Med.	Sept. 8	Nov. 10	3.25	5.85	5.20	4.55
Helen Frick.....	July 28	Short	Sept. 25	Nov. 23	2.75	4.95	4.40	3.85
Thanksgiving Pink.....	July 28	Med.	Sept. 25	Nov. 23	2.75	4.95	4.40	3.85
Ed. Seidewitz.....	July 30	Tall	Sept. 25	Nov. 25	2.50	4.50	4.00	3.50
Pink Mistletoe.....	Aug. 4	Med.	Sept. 30	Dec. 10	2.50	4.50	4.00	3.50

Odd Flowered Spider Types

<u>Name</u>	<u>Last Pinch</u>	<u>Height</u>	<u>Select Bud</u>	<u>Flowering Date</u>	<u>50 per 50</u>	<u>100-450 per 100</u>	<u>500 up per 100</u>
Kay Tashima—White.....	July 12	Med.	Aug. 25	Oct. 25	\$3.50	\$6.50	\$6.00
Queen's Lace—White.....	July 16	Med.	Sept. 5	Nov. 1	5.00	9.00	8.00
White Rayonante—White	July 16	Med.	Sept 5	Nov. 5	3.50	6.50	6.00
Mrs. R. A. Walker—							
Deep Lavender.....	July 16	Med.	Sept. 5	Nov. 1	3.50	6.50	6.00
Red Spider—Magenta.....	July 16	Med.	Sept. 5	Nov. 5	3.50	6.50	6.00
Mamoru—Bronze.....	July 16	Med.	Sept. 5	Nov. 5	3.50	6.50	6.00
Sue Sally Jones—Yellow..	July 16	Med.	Sept. 5	Nov. 5	3.50	6.50	6.00
Peggy Ann Hoover—Pink	July 19	Med.	Sept. 10	Nov. 10	3.50	6.50	6.00

Minimum Order 50 Cuttings of a Variety



Pompon and Decorative Varieties

YELLOW

Name	Last Pinch	Height	Size & Type	Flowering Date	50 per 50	100-450 per 100	500-2450 per 100	2500 up per 100
Gold Coast.....	July 12	Med.	Int. Pom.	Oct. 25	\$3.00	\$5.40	\$4.80	\$4.20
*Golden Herald.....	July 12	Med.	L. Dec.	Oct. 25	2.75	4.95	4.40	3.85
Yellow Dot.....	July 12	Med.	Int. Pom.	Oct. 25	2.50	4.50	4.00	3.50
Yellow Arcadia.....	July 16	Med.	Int. Pom.	Oct. 28	2.75	4.95	4.40	3.85
Mary L. Hall.....	July 16	Tall	Int. Pom.	Nov. 1	2.50	4.50	4.00	3.50
Barcarole.....	July 19	Med.	Int. Pom.	Nov. 5	2.75	4.95	4.40	3.85
Constellation.....	July 19	Med.	Int. Dec.	Nov. 5	3.50	6.30	5.60	4.90
Nuggets.....	July 19	Short	S. Pom.	Nov. 5	2.50	4.50	4.00	3.50
Yellow Cassandra.....	July 19	Med.	Int. Pom.	Nov. 5	5.00	9.00	8.00	7.00
Golden Chord.....	July 19	Med.	Int. Pom.	Nov. 10	5.00	9.00	8.00	7.00
Princeton.....	July 22	Med.	Int. Dec.	Nov. 15	3.00	5.40	4.80	4.20
Forty-Niner.....	July 22	Med.	Int. Pom.	Nov. 15	5.00	9.00	8.00	7.00
Yellow Fellow.....	July 22	Med.	Int. Dec.	Nov. 15	2.75	4.95	4.40	3.85
*Goldsmith.....	July 28	Med.	L. Dec.	Nov. 25	2.75	4.95	4.40	3.85
Sunnyside.....	July 28	Med.	Int. Pom.	Nov. 25	2.75	4.95	4.40	3.85
Yellow Cordova.....	July 28	Short	Int. Dec.	Nov. 30	2.75	4.95	4.40	3.85
Golden Harvest.....	July 28	Med.	S. Pom.	Dec. 1	5.00	9.00	8.00	7.00
Omega.....	July 31	Med.	Int. Pom.	Dec. 5	3.50	6.30	5.60	4.90
Yellow Cameo.....	July 31	Med.	Int. Dec.	Dec. 5	3.00	5.40	4.80	4.20
Yellow Riviera.....	Aug. 2	Med.	Int. Dec.	Dec. 10	5.00	9.00	8.00	7.00
December Gold.....	Aug. 2	Med.	L. Pom.	Dec. 15	2.75	4.95	4.40	3.85
Vibrant.....	Aug. 4	Med.	L. Dec.	Dec. 20	2.75	4.95	4.40	3.85
Golden Anniversary.....	Aug. 10	Med.	Int. Pom.	Dec. 25	4.00	7.20	6.40	5.60
Yellow Snow.....	Aug. 10	Med.	Int. Dec.	Dec. 25	2.50	4.50	4.00	3.50
Yuleflame.....	Aug. 10	Med.	Int. Dec.	Dec. 30	4.00	7.20	6.40	5.60

WHITE

Irene.....	July 8	Short	S. Pom.	Oct. 15	2.50	4.50	4.00	3.50
Minong.....	July 12	Short	S. Pom.	Oct. 20	2.75	4.95	4.40	3.85
Cotton Tip.....	July 12	Med.	Int. Pom.	Oct. 25	2.75	5.00	4.50	4.00
Popcorn.....	July 12	Med.	Int. Pom.	Oct. 25	5.00	9.00	8.00	7.00
Pinocchio.....	July 12	Tall	S. Pom.	Oct. 25	3.00	5.40	4.80	4.20
Arcadia.....	July 16	Med.	Int. Pom.	Oct. 28	2.75	4.95	4.40	3.85
Sea Gull.....	July 16	Tall	Int. Pom.	Nov. 1	2.50	4.50	4.00	3.50
*White Doty.....	July 16	Med.	L. Pom.	Nov. 1	2.50	4.50	4.00	3.50
Encore.....	July 19	Med.	Int. Pom.	Nov. 5	5.00	9.00	8.00	7.00
Rev. Bushnell.....	July 19	Tall	Int. Pom.	Nov. 8	3.00	5.40	4.80	4.20
Vesper.....	July 19	Tall	Int. Pom.	Nov. 10	2.50	4.50	4.00	3.50
Moonglow.....	July 22	Med.	Int. Pom.	Nov. 15	5.00	9.00	8.00	7.00
Matchless.....	July 25	Tall	Int. Pom.	Nov. 20	3.00	5.40	4.80	4.20
Seafoam.....	July 25	Med.	Int. Pom.	Nov. 20	2.50	4.50	4.00	3.50
*Priscilla.....	July 28	Tall	L. Pom.	Nov. 23	2.75	4.95	4.40	3.85
Crystal Beauty.....	July 28	Med.	L. Pom.	Nov. 28	5.00	9.00	8.00	7.00
Cordova.....	July 28	Short	Int. Dec.	Nov. 30	2.75	4.95	4.40	3.85
Cameo.....	July 31	Med.	Int. Dec.	Dec. 5	2.75	4.95	4.40	3.85
*Silversmith.....	Aug. 2	Med.	L. Dec.	Dec. 10	5.00	9.00	8.00	7.00
Snowcrest.....	Aug. 2	Med.	Int. Pom.	Dec. 12	5.00	9.00	8.00	7.00
Snowcap.....	Aug. 4	Med.	Int. Pom.	Dec. 15	5.00	9.00	8.00	7.00
Revelation.....	Aug. 10	Tall	Int. Pom.	Dec. 25	2.25	4.05	3.60	3.15
Snow.....	Aug. 10	Med.	Int. Pom.	Dec. 25	2.50	4.50	4.00	3.50

Minimum Order 50 Cuttings of a Variety

*Responds to Disbudding.



Pompon and Decorative Varieties

PINK

Name	Last Pinch	Height	Size & Type	Flowering Date	50 per 50	100-450 per 100	500-2450 per 100	2500 up per 100
Jewell.....	July 8	Short	S. Pom.	Oct. 15	\$2.50	\$4.50	\$4.00	\$3.50
Caroline Yosick.....	July 8	Med.	S. Dec.	Oct. 20	3.50	6.30	5.60	4.90
Mary McArthur.....	July 12	Tall	Int. Pom.	Oct. 25	4.00	7.20	6.40	5.60
Pink Dot.....	July 12	Med.	Int. Pom.	Oct. 25	2.50	4.50	4.00	3.50
Jessie.....	July 12	Med.	Int. Pom.	Oct. 25	2.50	4.50	4.00	3.50
Dark Bulkeley.....	July 19	Tall	Int. Pom.	Nov. 8	3.00	5.40	4.80	4.20
*Thyra.....	July 19	Med.	L. Pom.	Nov. 10	2.75	4.95	4.40	3.85
*Masterpiece.....	July 22	Med.	L. Pom.	Nov. 15	2.50	4.50	4.00	3.50
Minuet.....	July 28	Med.	Int. Pom.	Nov. 25	3.00	5.40	4.80	4.20
Riviera.....	Aug. 2	Med.	Int. Dec.	Dec. 10	2.75	4.95	4.40	3.85
Minstrel.....	Aug. 10	Med.	L. Pom.	Dec. 20	4.00	7.20	6.40	5.60
Defiance.....	Aug. 10	Med.	Int. Dec.	Dec. 20	5.00	9.00	8.00	7.00

BRONZE and RED

Firebrand.....	July 12	Med.	Int. Dec.	Oct. 25	2.50	4.50	4.00	3.50
Seneca.....	July 16	Med.	Int. Dec.	Nov. 1	3.50	6.30	5.60	4.90
Butterscotch.....	July 19	Med.	Int. Pom.	Nov. 5	5.00	9.00	8.00	7.00
Cassandra.....	July 19	Med.	Int. Pom.	Nov. 5	2.75	4.95	4.40	3.85
Red Rust.....	July 19	Med.	Int. Dec.	Nov. 5	3.50	6.30	5.60	4.90
Rubicon.....	July 19	Med.	L. Dec.	Nov. 5	5.00	9.00	8.00	7.00
Samovar.....	July 19	Med.	Int. Dec.	Nov. 10	5.00	9.00	8.00	7.00
Navaho.....	July 19	Med.	Int. Dec.	Nov. 10	3.00	5.40	4.80	4.20
*Bronze Masterpiece.....	July 22	Med.	L. Pom.	Nov. 15	2.50	4.50	4.00	3.50
Red Princeton.....	July 22	Med.	Int. Dec.	Nov. 15	3.00	5.40	4.80	4.20
Legal Tender.....	July 25	Med.	Int. Dec.	Nov. 20	2.50	4.50	4.00	3.50
Rusticon.....	July 25	Med.	Int. Dec.	Nov. 20	3.00	5.40	4.80	4.20
*Bronze Goldsmith.....	July 28	Med.	L. Dec.	Nov. 25	2.75	4.95	4.40	3.85
Bronze Minuet.....	July 28	Med.	Int. Pom.	Nov. 25	4.00	7.20	6.40	5.60
Debonair.....	Aug. 2	Tall	L. Pom.	Dec. 10	3.00	5.40	4.80	4.20
Bronze Riviera.....	Aug. 2	Med.	Int. Dec.	Dec. 10	5.00	9.00	8.00	7.00

Minimum Order 50 Cuttings of a Variety

*Responds to Disbudding.

Insecticides and Fungicides

Benzene Hexachloride Spray Pt. \$5.00 — Qt. \$8.00 — Gal. \$25.00	NNOR Gal. \$10.00
Calcium Cyanide G. Fumigant 5 lbs. \$3.75 — 25 lbs. 12.50	Parathion Bombs 4 lb. Bombs—ea. 10.00 (2 Bombs Minimum Order)
Deenate 50 W. (DDT) 4 lbs. \$2.25 — 25 lbs. 11.25	Parathion Dust 2% 25 lbs. \$10.00 — 50 lbs. 18.00
DuPont Spreader Sticker Gal. \$6.25 — 5 Gal. 30.00	Parathion Spray—15% Wettable 4 lb. bag 7.00
Fermate 3 lbs. \$2.70 — 25 lbs. 21.75	P40 25 lbs. \$4.75 — 50 lbs. 9.00 100 lbs. \$17.00 — 1000 lbs. 160.00
Isotox 15% B.H.C. 50 lbs. 20.00	Sodium Selenate per lb. 4.00
Loro Gal. 12.00	TEPP Bombs 4 lb. Bombs — each 10.00
Nicofume Liquid Gal. 12.55	Tobacco Dust 100 lbs. \$3.50 — Ton 65.00
Nicofume Pressure Fumigators 1/2 lb. cans (12 cans) 4.60 1 lb. cans (12 cans) 7.95	Vapotone Gal. 11.90
	Zerlate 3 lbs \$2.70 — 25 lbs. 21.25



Single-Daisy Type Varieties

YELLOW

Name	Last Pinch	Height	Size & Type	Flowering Date	50 per 50	100-450 per 100	500-2450 per 100	2500 up per 100
Starbright.....	July 12	Med.	Large	Oct. 25	\$5.00	\$9.00	\$8.00	\$7.00
Yellow Daisy.....	July 16	Med.	Int.	Nov. 1	2.75	5.00	4.50	4.00
Golden Mensa.....	July 22	Med.	Int.	Nov. 10	2.75	4.95	4.40	3.85
*Golden Jane.....	July 28	Tall	Large	Nov. 28	2.75	4.95	4.40	3.85
Champagne.....	July 28	Med.	Int.	Dec. 1	5.00	9.00	8.00	7.00
Cinderella.....	Aug. 5	Med.	Int.	Dec. 5	5.00	9.00	8.00	7.00
Sunkist.....	Aug. 10	Med.	Int.	Dec. 20	3.00	5.50	5.00	4.50

WHITE

White Mensa.....	July 22	Med.	Int.	Nov. 10	2.75	4.95	4.40	3.85
*White Valencia.....	July 28	Tall	Large	Nov. 28	5.00	9.00	8.00	7.00
Yukon.....	Aug. 7	Tall	Int.	Dec. 10	2.50	4.50	4.00	3.50

PINK

October Pink.....	July 16	Med.	Int.	Oct. 28	3.00	5.40	4.80	4.20
W. H. Buckingham.....	July 16	Short	Int.	Nov. 3	2.75	5.00	4.50	4.00
Ballerina.....	July 16	Med.	Large	Nov. 1	5.00	9.00	8.00	7.00
Brocade.....	July 22	Tall	Int.	Nov. 15	3.50	6.50	6.00	5.50
Soprano.....	July 22	Med.	Int.	Nov. 15	5.00	9.00	8.00	7.00
Hasegawa Pink.....	July 28	Med.	Int.	Nov. 25	2.50	4.50	4.00	3.50
*Valencia.....	July 28	Tall	Large	Nov. 28	2.75	4.95	4.40	3.85
*Dark Valencia.....	July 28	Tall	Large	Nov. 28	2.75	4.95	4.40	3.85
Rosalind.....	Aug. 7	Tall	Int.	Dec. 10	2.25	4.05	3.60	3.15

BRONZE

Bronze Buckingham.....	July 16	Short	Int.	Nov. 3	2.75	5.00	4.50	4.00
Sylvanna.....	July 22	Med.	Int.	Nov. 10	2.50	4.50	4.00	3.50
Bourbon.....	July 25	Med.	Int.	Nov. 20	5.00	9.00	8.00	7.00
*Apricot Valencia.....	July 28	Tall	Large	Nov. 28	2.75	4.95	4.40	3.85
Galaxy.....	Aug. 5	Med.	Int.	Dec. 5	5.00	9.00	8.00	7.00

RED

Red Daisy.....	July 19	Med.	Int.	Nov. 5	3.00	5.40	4.80	4.20
Bittersweet.....	July 20	Tall	Int.	Nov. 8	2.75	4.95	4.40	3.85
Festival.....	July 28	Med.	Int.	Nov. 25	5.00	9.00	8.00	7.00
Sarong.....	Aug. 7	Med.	Int.	Dec. 15	3.00	5.40	4.80	4.20
Holiday.....	Aug. 7	Med.	Int.	Dec. 15	5.00	9.00	8.00	7.00
Christmas Star.....	Aug. 7	Med.	Int.	Dec. 20	4.00	7.20	6.40	5.60
Merrymaker.....	Aug. 7	Med.	Int.	Dec. 20	5.00	9.00	8.00	7.00

Anemone Flowering Varieties

YELLOW

*Yellow Shasta.....	July 22	Med.	Int.	Nov. 10	5.00	9.00	8.00	7.00
Sunray.....	July 22	Med.	Int.	Nov. 15	2.75	4.95	4.40	3.85
*Susanne Miller.....	July 25	Tall	Large	Nov. 18	2.50	4.50	4.00	3.50
*Yellow L. I. Beauty.....	July 25	Med.	Large	Nov. 20	5.00	9.00	8.00	7.00
*Yellow Supreme.....	Aug. 2	Med.	Large	Dec. 10	2.50	4.50	4.00	3.50

WHITE

Little America.....	July 19	Short	Int.	Nov. 10	2.25	4.05	3.60	3.15
*Shasta.....	July 22	Med.	Int.	Nov. 10	2.75	4.95	4.40	3.85
*White Norma.....	July 25	Tall	Large	Nov. 18	2.50	4.50	4.00	3.50
*Long Island Beauty.....	July 25	Med.	Large	Nov. 20	2.50	4.50	4.00	3.50
Nevada.....	July 28	Med.	Int.	Nov. 25	2.75	4.95	4.40	3.85
*White Supreme.....	Aug. 2	Med.	Large	Dec. 10	2.50	4.50	4.00	3.50
Garza Supreme.....	Aug. 4	Med.	Int.	Dec. 15	2.75	4.95	4.40	3.85

*Responds to Disbudding.

Minimum Order 50 Cuttings of a Variety



Anemone Varieties (Cont.)

PINK

Name	Last Pinch	Type	Spray or Disbud	Flowering Date	50 per 50	100-450 per 100	500-2450 per 100	2500 up per 100
Linda Lou.....	July 22	Med.	Int.	Nov. 10	2.75	4.95	4.40	3.85
*Freida.....	July 22	Med.	Int.	Nov. 15	2.50	4.50	4.00	3.50
*Norma.....	July 25	Tall	Large	Nov. 18	2.50	4.50	4.00	3.50
*Dark Pink Norma.....	July 25	Tall	Large	Nov. 18	2.50	4.50	4.00	3.50
*Pink L. I. Beauty.....	July 25	Med.	Large	Nov. 20	5.00	9.00	8.00	7.00
*Beautiful Lady.....	July 28	Short	Large	Nov. 25	2.50	4.50	4.00	3.50
*Enchantress.....	Aug. 2	Med.	Large	Dec. 5	2.50	4.50	4.00	3.50
*Dark Pink Supreme.....	Aug. 2	Med.	Large	Dec. 10	2.50	4.50	4.00	3.50

BRONZE

Yolanda.....	July 28	Med.	Int.	Nov. 25	2.50	4.50	4.00	3.50
*Bronze Supreme.....	Aug. 2	Med.	Large	Dec. 10	2.50	4.50	4.00	3.50

RED

*The Titan.....	July 22	Med.	Large	Nov. 10	2.50	4.50	4.00	3.50
*Red Rolinda.....	July 28	Med.	Int.	Nov. 23	2.50	4.50	4.00	3.50
*Red Supreme.....	Aug. 2	Med.	Large	Dec. 10	5.00	9.00	8.00	7.00

Pot Plant Varieties

YELLOW

Gold Lode.....	Aug. 24	L. F. Dec.	Disbud	Oct. 15	\$2.50	\$4.50	\$4.00	\$3.50
Mrs. H. E. Kidder.....	Aug. 24	L. F. Inc.	Disbud	Oct. 20	2.50	4.50	4.00	3.50
Blazing Gold.....	Aug. 24	L. F. Inc.	Disbud	Oct. 25	3.00	5.40	4.80	4.20
Sunglow.....	Aug. 24	L. F. Inc.	Disbud	Oct. 25	2.75	4.95	4.40	3.85
Indianapolis Yellow.....	Aug. 29	L. F. Inc.	Disbud	Nov. 8	3.00	5.40	4.80	4.20
Sunray.....	Sept. 3	Int. Anem.	Spray	Nov. 15	2.75	4.95	4.40	3.85
Yellow Fellow.....	Sept. 3	Int. Dec.	Spray	Nov. 15	2.75	4.95	4.40	3.85
Bonnaffon DeLuxe.....	Sept. 3	L. F. Inc.	Disbud	Nov. 20	2.25	4.05	3.60	3.15
Friendly Rival.....	Sept. 3	L. F. Inc.	Disbud	Nov. 20	2.75	4.95	4.40	3.85
Yellow L. I. Beauty.....	Sept. 3	L. Anem.	Disbud	Nov. 20	5.00	9.00	8.00	7.00
Marie De Petris.....	Sept. 3	L. F. Inc.	Disbud	Nov. 23	2.75	4.95	4.40	3.85
Sun Gold.....	Sept. 8	L. F. Inc.	Disbud	Nov. 25	2.75	5.00	4.50	4.00

WHITE

Minong.....	Aug 24	S. Pom.	Spray	Oct. 20	2.75	4.95	4.40	3.85
Granite State.....	Aug. 24	L. Pom.	Disbud	Oct. 25	3.00	5.40	4.80	4.20
Indianapolis White.....	Aug. 29	L. F. Inc.	Disbud	Nov. 8	3.00	5.40	4.80	4.20
Richard Mandell.....	Aug. 29	L. Pom.	Disbud	Nov. 10	2.50	4.50	4.00	3.50
Little America.....	Aug. 29	Int. Anem.	Disbud	Nov. 10	2.25	4.05	3.60	3.15
Marketeer.....	Sept. 3	L. F. Inc.	Disbud	Nov. 18	2.75	4.95	4.40	3.85
Long Island Beauty.....	Sept. 3	L. Anem.	Disbud	Nov. 20	2.50	4.50	4.00	3.50
Margaret Moeller.....	Sept. 8	L. F. Inc.	Disbud	Dec. 5	2.75	4.95	4.40	3.85

BRONZE and RED

Indianapolis Bronze.....	Aug. 29	L. F. Inc.	Disbud	Nov. 8	3.00	5.40	4.80	4.20
Bronze Masterpiece.....	Aug. 29	L. Pom.	Disbud	Nov. 15	2.50	4.50	4.00	3.50
Gypsy.....	Aug. 29	S. Anem.	Spray	Nov. 15	2.50	4.50	4.00	3.50
Legal Tender.....	Sept. 3	Int. Dec.	Spray	Nov. 20	2.50	4.50	4.00	3.50
Red Rolinda.....	Sept. 8	Int. Anem.	Spray	Nov. 23	2.50	4.50	4.00	3.50

PINK

J. W. Prince.....	Aug. 29	L. F. Inc.	Disbud	Nov. 5	2.75	4.95	4.40	3.85
Indianapolis Pink.....	Aug. 29	L. F. Inc.	Disbud	Nov. 8	3.00	5.40	4.80	4.20
Thyra.....	Aug. 29	L. Pom.	Disbud	Nov. 10	2.75	4.95	4.40	3.85
Queen of the Pinks.....	Aug. 29	L. Pom.	Disbud	Nov. 10	2.75	4.95	4.40	3.85
Masterpiece.....	Aug. 29	L. Pom.	Disbud	Nov. 15	2.50	4.50	4.00	3.50
Pink L. I. Beauty.....	Sept. 3	L. Anem.	Disbud	Nov. 20	5.00	9.00	8.00	7.00
Helen Frick.....	Sept. 3	L. F. Inc.	Disbud	Nov. 25	2.75	4.95	4.40	3.85
Beautiful Lady.....	Sept. 3	L. Anem.	Disbud	Nov. 25	2.50	4.50	4.00	3.50

*Responds to Disbudding.

Minimum Order 50 Cuttings of a Variety



Hardy or Garden Varieties

YELLOW

Name	Last* Pinch	Flowering Date	50 per 50	100-450 per 100	500 up per 100
Yellow Cushion.....	June 15	Sept. 8	\$2.75	\$5.00	\$4.50
Early Yellow,(Light Golden).....	June 20	Sept. 15	2.75	5.00	4.50
Charles Nye,(Lemon Yellow).....	June 25	Sept. 24	4.00	7.50	7.00
Honeycomb,(Golden).....	June 25	Sept. 25	4.00	7.50	7.00
James Eadie,(Bronze Yellow).....	June 30	Sept. 28	4.00	7.50	7.00
Chiquita,(Deep Lemon).....	July 4	Oct. 5	4.00	7.50	7.00
Yellow Avalanche,(Golden Yellow).....	July 4	Oct. 5	4.00	7.50	7.00
Yellow Spoon.....	July 4	Oct. 8	2.75	5.00	4.50
Rodell Imp.....	July 10	Oct. 20	2.50	4.50	4.00

WHITE

White Cushion.....	June 15	Sept. 8	2.75	5.00	4.50
Avalanche,(White).....	July 4	Oct. 5	2.75	5.00	4.50
White Wonder,(Cream).....	June 30	Oct. 1	3.00	5.50	5.00
Chris Columbus,(Cream White).....	June 30	Oct. 1	3.00	5.50	5.00
Irene,(White).....	July 8	Oct. 15	2.50	4.50	5.00

PINK

Major Cushion,(Lavender).....	June 15	Sept. 8	2.75	5.00	4.50
Early Wonder,(Lavender).....	June 25	Sept. 25	2.50	4.50	4.00
Spellbound,(Lavender).....	June 25	Sept. 25	3.50	6.50	6.00
Rosita,(Persian Rose).....	June 30	Sept. 28	4.00	7.50	7.00
Mrs. DuPont,(Peach Pink).....	July 4	Oct. 5	3.00	5.50	5.00
Allegro,(Shrimp Pink).....	July 8	Oct. 15	3.00	5.50	5.00
Jewell,(Lavender).....	July 8	Oct. 15	2.50	4.50	4.00

BRONZE and RED

Early Bronze,(Orange Br.).....	June 20	Sept. 15	2.75	5.00	4.50
Olive Longland,(Apricot Salmon).....	June 25	Sept. 25	4.00	7.50	7.00
Burgundy,(Wine Red).....	July 4	Oct. 5	2.75	5.00	4.50
Ruby Pompon,(Ruby Crimson).....	July 4	Oct. 5	2.75	5.00	4.50
Red Velvet,(Crimson).....	July 4	Oct. 5	2.50	4.50	4.00
Aviator,(Copper).....	July 4	Oct. 8	3.00	5.50	5.00

*Pinch three weeks later if wanted for plant sale or in landscape border.



Garden Mums for Retail Sales



Cart Used for Transporting Cut Flowers to Packing Shed

Fred C. Gloeckner & Company, Incorporated

15 East 26th Street New York, 10, N. Y.

1950 ROOTED CHRYSANTHEMUM CUTTING ORDER

Special Instructions:

Sold To: _____

Ship To: _____

Date of Order

When Required

Ship Via:

Quan.	Variety	Price per 50	Price per 100			Amt.
			100 to 450	500 to 2450	2500 and up	
.....	Albatross	2.75	4.95	4.40	3.85	.....
.....	Anaconda	3.00	5.40	4.80	4.20	.....
.....	Arcadia	2.75	4.95	4.40	3.85	.....
.....	Ballerina	5.00	9.00	8.00	7.00	.....
.....	Barcarole	2.75	4.95	4.40	3.85	.....
.....	Betsy Ross	2.75	4.95	4.40	3.85	.....
.....	Bittersweet	2.75	4.95	4.40	3.85	.....
.....	Blazing Gold	3.00	5.40	4.80	4.20	.....
.....	Bonnaffon Deluxe	2.25	4.05	3.60	3.15	.....
.....	Bourbon	5.00	9.00	8.00	7.00	.....
.....	Bronze Goldsmith	2.75	4.95	4.40	3.85	.....
.....	Bronze Masterpiece	2.50	4.50	4.00	3.50	.....
.....	Bronze Minuet	4.00	7.20	6.40	5.60	.....
.....	Bronze Riviera	5.00	9.00	8.00	7.00	.....
.....	Butterscotch	5.00	9.00	8.00	7.00	.....
.....	Cameo	2.75	4.95	4.40	3.85	.....
.....	Carolyn Yosick	3.50	6.30	5.60	4.90	.....
.....	Cassandra	2.75	4.95	4.40	3.85	.....
.....	Champagne	5.00	9.00	8.00	7.00	.....
.....	Chattanooga	2.75	4.95	4.40	3.85	.....
.....	Christmas Star	4.00	7.20	6.40	5.60	.....
.....	Cinderella	5.00	9.00	8.00	7.00	.....
.....	Constellation	3.50	6.30	5.60	4.90	.....
.....	Cordova	2.75	4.95	4.40	3.85	.....
.....	Crystal Beauty	5.00	9.00	8.00	7.00	.....
.....	Dark Bulkeley	3.00	5.40	4.80	4.20	.....
.....	Dark Orchid Queen	3.50	6.30	5.60	4.90	.....
.....	Dark Valencia	2.75	4.95	4.40	3.85	.....
.....	Debonair	3.00	5.40	4.80	4.20	.....
.....	December Glory	2.75	4.95	4.40	3.85	.....
.....	December Gold	2.75	4.95	4.40	3.85	.....
.....	Defiance	5.00	9.00	8.00	7.00	.....
.....	Detroit News	3.00	5.40	4.80	4.20	.....
.....	Ed. Seidewitz	2.50	4.50	4.00	3.50	.....
.....	Encore	5.00	9.00	8.00	7.00	.....
.....	Festival	5.00	9.00	8.00	7.00	.....
.....	Firebird	2.50	4.50	4.00	3.50	.....
.....	Forty-Niner	5.00	9.00	8.00	7.00	.....
.....	Friendly Rival	2.75	4.95	4.40	3.85	.....
.....	Galaxy	5.00	9.00	8.00	7.00	.....
.....	Garza	2.75	4.95	4.40	3.85	.....
.....	Gladys Pearson	2.50	4.50	4.00	3.50	.....
.....	Gold Coast	3.00	5.40	4.80	4.20	.....
.....	Golden Anniversary	4.00	7.20	6.40	5.60	.....
.....	Golden Chord	5.00	9.00	8.00	7.00	.....
.....	Golden Harvest	5.00	9.00	8.00	7.00	.....

Quan.	Variety	Price per 50	Price per 100			Amt.
			100 to 450	500 to 2450	2500 and up	
.....	Golden Herald	2.75	4.95	4.40	3.85	.....
.....	Golden Mensa	2.75	4.95	4.40	3.85	.....
.....	Golden Mrs. Ross	2.50	4.50	4.00	3.50	.....
.....	Golden Pearson	2.50	4.50	4.00	3.50	.....
.....	Gold Lede	2.50	4.50	4.00	3.50	.....
.....	Goldsmith	2.75	4.95	4.40	3.85	.....
.....	Good News	3.00	5.40	4.80	4.20	.....
.....	Granite State	3.00	5.40	4.80	4.20	.....
.....	Harvester	3.50	6.30	5.60	4.90	.....
.....	Helen Frick	2.75	4.95	4.40	3.85	.....
.....	Holiday	5.00	9.00	8.00	7.00	.....
.....	Ind. Bronze	3.00	5.40	4.80	4.20	.....
.....	Ind. Pink	3.00	5.40	4.80	4.20	.....
.....	Ind. White	3.00	5.40	4.80	4.20	.....
.....	Ind. Yellow	3.00	5.40	4.80	4.20	.....
.....	Jean Elizabeth	3.25	5.85	5.20	4.55	.....
.....	J. W. Prince	2.75	4.95	4.40	3.85	.....
.....	Legal Tender	2.50	4.50	4.00	3.50	.....
.....	Linda Lou	2.75	4.95	4.40	3.85	.....
.....	Little America	2.25	4.05	3.60	3.15	.....
.....	Long Island Beauty	2.50	4.50	4.00	3.50	.....
.....	Margaret Moeller	2.75	4.95	4.40	3.85	.....
.....	Marie DePetris	2.75	4.95	4.40	3.85	.....
.....	Marketeer	2.75	4.95	4.40	3.85	.....
.....	Mary L. Hall	2.50	4.50	4.00	3.50	.....
.....	Mary McArthur	4.00	7.20	6.40	5.60	.....
.....	Masterpiece	2.50	4.50	4.00	3.50	.....
.....	Matchless	3.00	5.40	4.80	4.20	.....
.....	Mefe	3.00	5.40	4.80	4.20	.....
.....	Merrymaker	5.00	9.00	8.00	7.00	.....
.....	Meteors	3.50	6.30	5.60	4.90	.....
.....	Minong	2.75	4.95	4.40	3.85	.....
.....	Minstrel	4.00	7.20	6.40	5.60	.....
.....	Minuet	3.00	5.40	4.80	4.20	.....
.....	Monument	2.50	4.50	4.00	3.50	.....
.....	Moonglow	5.00	9.00	8.00	7.00	.....
.....	Mrs. Kidder	2.50	4.50	4.00	3.50	.....
.....	Mrs. Roy	3.00	5.40	4.80	4.20	.....
.....	Navaho	3.00	5.40	4.80	4.20	.....
.....	Nevada	2.75	4.95	4.40	3.85	.....
.....	Nuggets	2.50	4.50	4.00	3.50	.....
.....	Oak Leaf	2.50	4.50	4.00	3.50	.....
.....	October Pink	3.00	5.40	4.80	4.20	.....
.....	Omega	3.50	6.30	5.60	4.90	.....
.....	Orchid Queen	3.25	5.85	5.20	4.55	.....
.....	Pink Chief	2.75	4.95	4.40	3.85	.....

OVER



Index

Index

A

ALBATROSS 34
 ALLEGRO 40
 AMBASSADOR 34
 ANACONDA 35
 APRICOT VALENCIA 38
 ARCADIA 36
 AVALANCHE 40
 AVIATOR 40

B

BALLERINA 34, 38
 BARCAROLE 36
 BEAUTIFUL LADY 39
 BETSY ROSS 34
 BITTERSWEET 38
 BLAZING GOLD 34, 39
 BONNAFFON DE LUXE 34, 39
 BOURBON 34, 38
 BROCADE 38
 BR. BUCKINGHAM 38
 BR. GOLDSMITH 37
 BR. MASTERPIECE 37, 39
 BR. MINUET 37
 BR. MISTLETOE 35
 BR. RIVIERA 37
 BR. SUPREME 39
 BURGUNDY 40
 BUTTERSCOTCH 34, 37

C

CAMEO 36
 CAROLINE YOSICK 37
 CASSANDRA 37
 CHAMPAGNE 34, 38
 CHARLES NYE 40
 CHATTANOOGA 34
 CHIQUITA 40
 CHRIS COLUMBUS 40
 CHRISTMAS STAR 38
 CINDERELLA 34, 38
 CONSTELLATION 36
 CORDOVA 36
 COTTON TOP 36
 CRYSTAL BEAUTY 33, 36

D

DK. BULKELEY 37
 DK. ORCHID QUEEN 35
 DK. PK. NORMA 39
 DK. PK. SUPREME 39
 DK. VALENCIA 38
 DEBONAIR 37
 DECEMBER GLORY 34
 DECEMBER GOLD 36
 DEFIANCE 34, 37
 DETROIT NEWS 35

E

EARLY BRONZE 40
 EARLY WONDER 40
 EARLY YELLOW 40
 ED. SEIDEWITZ 35
 ENCHANTRESS 39
 ENCORE 33, 36

F

FESTIVAL 33, 38
 FIREBIRD 37

FORTY-NINER 34, 36
 FREIDA 39
 FRIENDLY RIVAL 34, 39

G

GALAXY 34, 38
 GARNET KING 35
 GARZA 38
 GLADYS PEARSON 35
 GOLD COAST 36
 GOLDEN ANNIVERSARY 36
 GOLDEN CHORD 34, 36
 GOLDEN HARVEST 34, 36
 GOLDEN HERALD 36
 GOLDEN JANE 38
 GOLDEN MENSA 38
 GOLDEN MISTLETOE 34
 GOLDEN MRS. ROSS 34
 GOLDEN PEARSON 34
 GOLD LODE 34, 39
 GOLDSMITH 36
 GOOD NEWS 34
 GRANITE STATE 39
 GYPSY 39

H

HARVESTER 34
 HASEGAWA PINK 38
 HELEN FRICK 35, 39
 HOLIDAY 33, 38
 HONEYCOMB 40

I

IND. BRONZE 35, 39
 IND. PINK 35, 39
 IND. WHITE 34, 39
 IND. YELLOW 34, 39
 IRENE 36, 40

J

JAMES EADIE 40
 JEAN ELIZABETH 34
 JESSIE 37
 JEWELL 37, 40
 J. W. PRINCE 35, 39

K

KAY TASHIMA 35

L

LEGAL TENDER 37, 39
 LINDA LOU 39
 LITTLE AMERICA 38, 39
 LONG ISLAND BEAUTY 38, 39

M

MAJOR CUSHION 40
 MAMORU 35
 MARGARET MOELLER 34, 39
 MARIE DEPETRIS 34, 39
 MARKETEEER 34, 39
 MARY L. HALL 36
 MARY McARTHUR 37

MASTERPIECE 37, 39
 MATCHLESS 36
 MEFO 34
 MERRYMAKER 33, 38
 METEORE 34
 MINONG 36, 39
 MINSTREL 37
 MINUET 37
 MONUMENT 34
 MOONGLOW 33, 36
 MRS. DUPONT 40
 MRS. KIDDER 34, 39
 MRS. R. A. WALKER 35
 MRS. ROY 35

N

NAVAHO 37
 NEVADA 38
 NORMA 39
 NUGGETS 36

O

OAK LEAF 35
 OCTOBER PINK 38
 OLIVE LONGHAND 40
 OMEGA 36
 ORCHID QUEEN 35

P

PEGGY ANN HOOVER 35
 PINK CHIEF 35
 PINK DOT 37
 PINK L. I. BEAUTY 34, 39
 PINK MISTLETOE 35
 PINOCCHIO 36
 POPCORN 33, 36
 PRINCETON 36
 PRISCILLA 36

Q

QUEEN OF PINKS 39
 QUEEN'S LACE 33, 35

R

RED DAISY 38
 RED PRINCETON 37
 RED ROLINDA 39
 RED RUST 37
 RED SPIDER 35
 RED SUPREME 39
 RED VELVET 40
 REVELATION 36
 REV. BUSHNELL 36
 RICHARD MANDEL 39
 RIVIERA 37
 RODELL IMP. 40
 ROSALIND 38
 ROSITA 40
 RUBICON 34, 37
 RUBY POMPON 40
 RUSTICON 37

S

SAMOVAR 34, 37
 SARONG 38

SEAFOAM 36
 SEA GULL 36
 SENECA 37
 SHASTA 38
 SILVER SHEEN 34
 SILVERSMITH 33, 36
 SMITH LATE WHITE 34
 SNOW 36
 SNOWCAP 33, 36
 SNOWCREST 33, 36
 SOPRANO 34, 38
 SPELLBOUND 40
 STARBRIGHT 34, 38
 SUE SALLY JONES 35
 SUNGLOW 34, 39
 SUN GOLD 34, 39
 SUNKIST 38
 SUNNYSIDE 36
 SUNRAY 38, 39
 SUANNE MILLER 38
 SYLVANNA 38

T

THANKS. PINK 35
 THE TITAN 39
 THYRA 37, 39
 TOBIN'S YELLOW 34

V

VALENCIA 38
 VESPER 36
 VIBRANT 36

W

W. H. BUCKINGHAM 38
 WHITE CUSHION 40
 WHITE DOT 36
 WHITE MENSA 38
 WHITE MISTLETOE 34
 WHITE NORMA 38
 WHITE RAYONANTE 35
 WHITE SUPREME 38
 WHITE VALENCIA 33, 38
 WHITE WONDER 40

Y

YEL. AMBASSADOR 34
 YEL. ARCADIA 36
 YEL. AVALANCHE 40
 YEL. CAMEO 36
 YEL. CASSANDRA 36
 YEL. CHATTANOOGA 34
 YEL. CORDOVA 36
 YEL. CUSHION 40
 YEL. DAISY 38
 YEL. DOT 36
 YEL. FELLOW 36, 39
 YEL. L. I. BEAUTY 34, 38, 39
 YEL. MEFO 34
 YEL. MONUMENT 34
 YEL. QUEEN 34
 YEL. RIVIERA 36
 YEL. SHASTA 38
 YEL. SNOW 36
 YEL. SPOON 40
 YEL. SUPREME 38
 YOLANDA 39
 YUKON 38
 YULEFLAME 36

ACIDITY 2	GARDEN VARIETIES 39	NEWER INSECTICIDES 31	SHIPPING FLOWERS 9
AERATION 2	GREENHOUSE	NOVELTY CHRY-	SINGLE VARIETIES 38
AIR FREIGHT 1	LEAF TYER 25	SANTHEMUMS 32, 33	SOILS 2
ANEMONE VARIETIES 38	INSECTICIDES AND	PESTS AND THEIR	SOIL MANAGEMENT 3
APHIDS 24	FUNGICIDES 37	CONTROL 28, 30	SOW BUGS 26
BLINDNESS 9	INSECTS AND	PINCHING 6	SPIDER VARIETIES 35
CHEMICAL	THEIR CONTROL 24, 27	PLANTING 5	STEAM STERILIZATION 2
STERILIZATION 2	LARGE FLOWERED	POMPON VARIETIES 36	STUNT 30
CONTINUOUS	VARIETIES 34, 35	POT PLANT CULTURE 22, 23	SYMPHYLIDS 26
FLOWERING 11	LEAF MINER 24	POT PLANT	TARNISHED PLANT BUGS 27
CORN EAR WORM 25	MEALY BUGS 25	VARIETIES 39	TAKING BUD 7
CULTURAL POINTERS 1-10	MIDGE 24	RAY BLIGHT 29	TEMPERATURE 9
CULTURED STOCK 31	MILDEW 28	RED SPIDER 26	TERMITES 27
CUT WORMS 25	MITES 26	RUST 29	THRIPS 27
DISBUDDING 7	MULCHES 4	SEPTORIA LEAF SPOT 29	TIME PINCHING 6
DODDER 30	NEMATODE, FOLIAR 28	SHADING	VERTICILLIUM WILT 29
FERTILIZERS 4	NEMATODE, ROOT KNOT 27	INFORMATION 11, 21	WATERING 8



*St. Joe
Boardwalk
and
Amusement
Park*

*St. Joe
Boardwalk*

